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ANNUAL DATA SUMMARY FOR 1987 CERC FIELD RESEARCH FACILITY

Volume II

APPENDIXES C THROUGH E

by

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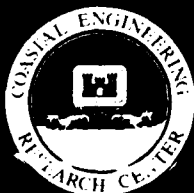


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APPENDIX C: WAVE DATA FOR GAGE 141

1. Wave data summaries for Gage 141 are presented for 1987 and for 1985 through 1987 in the following forms:

Daily H_{mo} and T_p

2. Figure C1 displays the individual wave height and peak spectral wave period values along with the monthly mean values.

Joint Distributions of H_{mo} and T_p

3. Annual and monthly joint distributions tables are presented in Tables C1 and C2, and data for 1985 through 1987 are in Tables C3 and C4. Each table gives the frequency (in parts per 10,000) for which the wave height and peak period were within the specified intervals; these values can be converted to percent by dividing by 100. Marginal totals are also included. The row total gives the total number of observations out of 10,000 which fell within each specified peak period interval. The column total gives the number of observations out of 10,000 which fell within each specified wave height interval.

Cumulative Distributions of Wave Height

4. Annual and monthly wave height distributions for 1987 are plotted in cumulative form in Figures C2 and C3. Data for 1985 through 1987 are in Figure C4.

Peak Spectral Wave Period Distributions

5. Annual and monthly peak wave period, T_p , distribution histograms for 1987 are presented in Figures C5 and C6. Data for 1985 through 1987 are in Figure C7.

Persistence of Wave Heights

6. Table C5 shows the number of times in 1987 when the specified wave height was equaled or exceeded at least once during each day for the duration (consecutive days). Data for 1985 through 1987 are given in Table C6. An example is shown below:

Height m	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	18	15		14	13	12		11	10	9				8		7			
1.0	50	34	24	21	18	14	12	8	7	3			2						
1.5	41	19	8	6	2	1													
2.0	22	9	5	1															
2.5	10	5	2																
3.0	6	1																	
3.5		1																	
4.0	1																		

This example indicates that wave heights equaled or exceeded 1.0 m 50 times for at least 1 day; 34 times for at least 2 days; 24 times for at least 3 days, etc. Therefore, on 16 occasions the height equaled or exceeded 1.0 m for 1 day exactly ($50 - 34 = 16$); on 10 occasions for 2 days; on 3 occasions for 3 days, etc. Note that the height exceeded 1 m 50 times for 1 day or longer, while heights exceeded 0.5 m only 18 times for this same duration. This change in durations occurred because the longer durations of lower waves may be interspersed with shorter, but more frequent, intervals of higher waves. For example, one of the times that the wave heights exceeded 0.5 m for 16 days may have represented 3 times the height exceeded 1 m for shorter durations.

Spectra

7. Monthly spectra for the offshore Waverider buoy (Gage 141) are presented in Figure C8. The plots show "relative" energy density as a function of wave frequency. These figures summarize the large number of spectra for each month. The figures emphasize the higher energy density associated with storms as well as the general shifts in energy density to different frequencies. As used here, "relative" indicates the spectra have been smoothed by the 3-D surface drawing routine. Consequently, extremely high- and low-energy density values are modified to produce a smooth surface.

The figures are not intended for quantitative measurements; however, they do provide the energy density as a function of frequency relative to the other spectra for the month.

8. Monthly and annual wave statistics for Gage 141 for 1987 and for 1985 through 1987 are presented in Table C7. Data for 1985 and 1986 are from Gage 640.

9. Figure C9 plots monthly time histories of wave height and period.

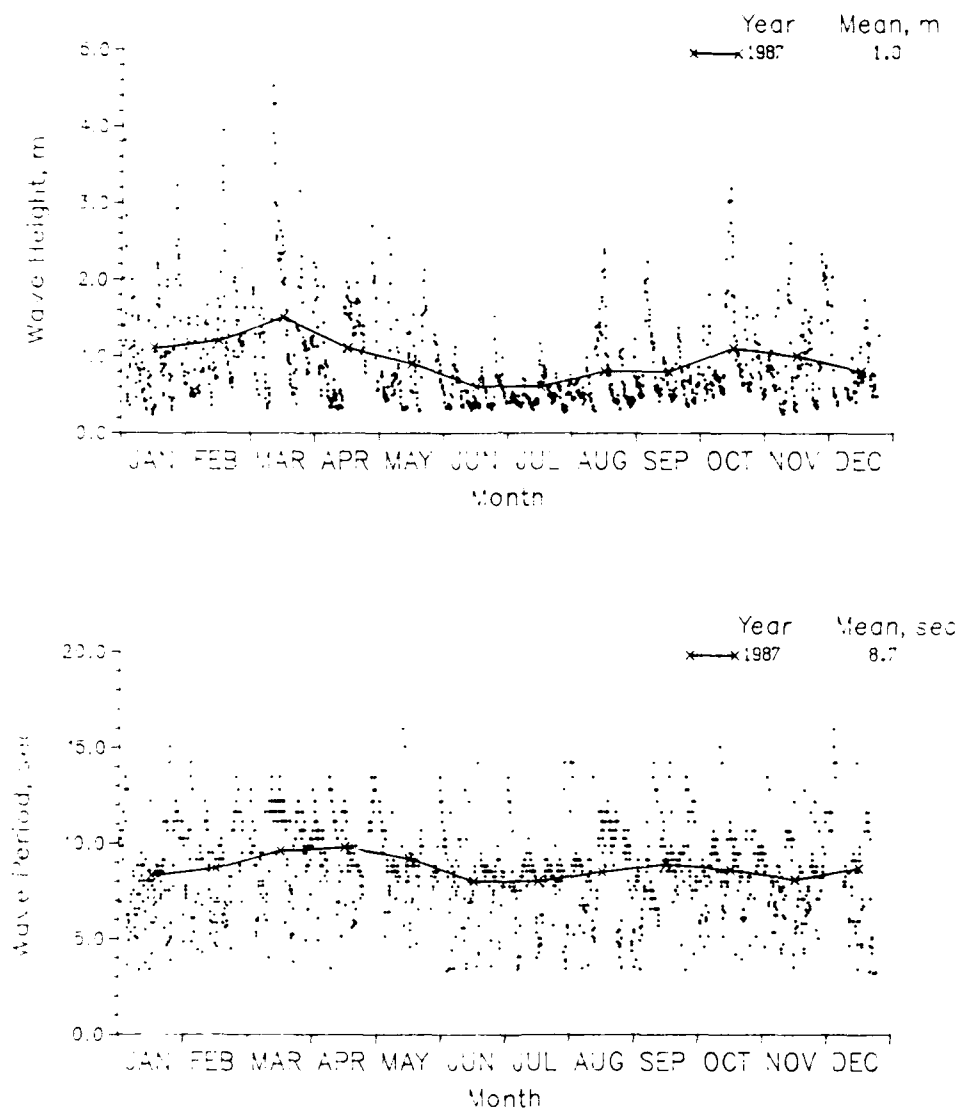


Figure C1. 1987 daily wave period values with monthly means for Gage 141

Table C1

Annual Joint Distribution of H_{mo} versus T_p

Annual 1987, Gage 141 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	74	37	7	81	289	926	407	437	126	200	.	2584
0.50 - 0.99	.	148	267	407	370	415	978	719	607	89	178	.	4178
1.00 - 1.49	.	22	119	244	193	193	289	237	281	15	81	.	1674
1.50 - 1.99	.	.	30	141	156	74	67	81	267	7	74	.	897
2.00 - 2.49	.	.	.	7	22	67	37	67	148	.	59	.	407
2.50 - 2.99	7	7	.	.	81	7	22	.	124
3.00 - 3.49	7	7	30	15	15	.	.	.	74
3.50 - 3.99	7	7	15	7	.	.	36
4.00 - 4.49	15	.	15
4.50 - 4.99	7	.	.	.	7
5.00 - Greater	0
Total	0	244	453	806	836	1052	2334	1533	1858	251	629	0	

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Table C2
Monthly Joint Distribution of H_{mo} versus T_p

January 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	167	.	.	83	333	750	83	83	167	417	.	2083	
0.50 - 0.99	.	167	167	250	250	583	1167	167	833	.	.	.	3584	
1.00 - 1.49	.	83	250	417	333	83	.	333	333	.	.	.	1832	
1.50 - 1.99	.	.	.	500	333	83	250	.	167	.	.	.	1333	
2.00 - 2.49	167	250	.	83	83	.	167	.	750	
2.50 - 2.99	250	.	.	.	250	
3.00 - 3.49	83	.	.	.	83	
3.50 - 3.99	83	.	.	.	83	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	417	417	1167	1166	1332	2167	666	1915	167	584	0		

February 1987, Gage 141													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	95	190	.	190	.	95	.	570
0.50 - 0.99	.	.	190	571	667	381	286	857	762	190	95	.	3999
1.00 - 1.49	.	.	286	286	476	286	286	571	571	95	571	.	3428
1.50 - 1.99	.	.	95	190	286	95	.	95	476	.	.	.	1237
2.00 - 2.49	.	.	.	95	.	.	.	95	95	.	.	.	285
2.50 - 2.99	95	.	.	.	95
3.00 - 3.49	95	.	.	190	.	.	.	.	285
3.50 - 3.99	95	.	.	.	.	95
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	0	571	1142	1524	857	762	1903	2189	285	761	0	

March 1987, Gage 141														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	164	246	82	82	246	.	.	.	820	
0.50 - 0.99	.	82	.	246	82	410	656	820	410	.	.	.	2706	
1.00 - 1.49	.	.	164	410	246	164	164	410	984	.	.	.	2542	
1.50 - 1.99	.	.	.	82	.	82	82	656	.	.	410	.	1394	
2.00 - 2.49	328	574	.	410	.	1312	
2.50 - 2.99	328	82	246	.	656	
3.00 - 3.49	82	.	.	.	82	
3.50 - 3.99	82	.	82	82	.	.	246	
4.00 - 4.49	164	.	164	
4.50 - 4.99	82	.	.	.	82	
5.00 - Greater	0	
Total	0	82	164	738	492	902	1066	1722	3444	164	1230	0		

(Continued)

(Sheet 1 of 4)

Table C2 (Continued)

April 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	93	.	556	93	833	185	278	.	2038	
0.50 - 0.99	.	93	93	.	370	185	370	278	926	93	463	.	2871	
1.00 - 1.49	.	.	.	93	.	185	926	741	93	.	278	.	2316	
1.50 - 1.99	.	.	.	370	278	.	185	278	741	93	463	.	2408	
2.00 - 2.49	185	.	93	.	278	
2.50 - 2.99	93	.	.	.	93	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	93	93	463	741	370	2037	1390	2871	371	1575	0		

May 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	97	680	777	485	.	291	.	2330	
0.50 - 0.99	.	.	97	97	291	388	1650	583	874	97	583	.	4660	
1.00 - 1.49	.	.	.	194	194	291	1068	97	.	.	.	.	1844
1.50 - 1.99	.	.	97	97	.	.	194	291	194	.	.	.	873	
2.00 - 2.49	97	97	.	.	.	.	194	
2.50 - 2.99	97	.	.	.	.	.	.	.	97	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	0	194	388	582	776	3689	1845	1553	97	874	0		

June 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	263	.	.	351	789	2368	526	702	263	175	.	5437	
0.50 - 0.99	.	351	439	351	263	614	1316	789	.	.	.	.	4123
1.00 - 1.49	.	.	88	.	88	88	88	.	.	.	.	.	352
1.50 - 1.99	.	.	88	.	.	.	.	.	.	.	.	.	88
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	614	615	351	702	1491	3772	1315	702	263	175	0		

(Continued)

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Table C2 (Continued)

July 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	165	165	83	83	744	3058	579	496	248	413	.	6034	
0.50 - 0.99	.	248	579	744	248	496	1240	165	.	.	83	.	3803	
1.00 - 1.49	.	.	83	83	.	.	.	.	.	.	.	.	166
1.50 - 1.99	0	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	413	827	910	331	1240	4298	744	496	248	496	0		

August 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- longer		
0.00 - 0.49	.	81	.	.	81	323	887	1371	1290	161	.	.	4194	
0.50 - 0.99	.	323	323	726	565	81	323	565	645	81	81	.	3713	
1.00 - 1.49	.	.	323	484	81	161	.	.	323	.	.	.	1372	
1.50 - 1.99	81	.	81	161	.	.	.	323	
2.00 - 2.49	81	323	.	.	.	404	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	404	646	1210	727	646	1210	2098	2742	242	81	0		

September 1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	83	.	.	333	583	417	167	167	417	.	2167	
0.50 - 0.99	.	250	167	333	417	417	1083	1583	833	250	417	.	5750	
1.00 - 1.49	.	.	.	83	83	333	583	250	.	.	.	.	1332
1.50 - 1.99	.	.	.	83	167	250	.	.	83	.	.	.	583	
2.00 - 2.49	167	.	.	.	.	.	.	167	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	250	250	499	667	1500	2249	2250	1083	417	834	0		

(Continued)

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Table C2 (Concluded)

October 1987, Gage 141 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	83	248	.	.	.	.	331
0.50 - 0.99	.	.	.	248	413	413	1983	1901	661	83	248	.	5950
1.00 - 1.49	.	83	165	331	165	83	165	331	496	.	.	.	1819
1.50 - 1.99	.	.	83	165	413	83	.	.	248	.	.	.	992
2.00 - 2.49	83	.	.	.	165	.	.	.	248
2.50 - 2.99	83	.	.	165	.	.	.	248
3.00 - 3.49	83	331	.	.	.	.	.	414
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	83	248	744	1074	745	2562	2480	1735	83	248	0	

November 1987, Gage 141 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	84	168	.	84	336	840	336	420	.	168	.	2436
0.50 - 0.99	.	.	420	504	672	336	1092	84	420	84	84	.	3696
1.00 - 1.49	.	.	.	336	336	588	168	84	84	84	84	.	1764
1.50 - 1.99	.	.	.	168	336	84	84	168	336	.	.	.	1176
2.00 - 2.49	336	336	84	168	.	.	.	924
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	84	588	1008	1428	1680	2520	756	1428	168	336	0	

December 1987, Gage 141 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	137	.	.	.	.	959	274	274	411	137	.	2192
0.50 - 0.99	.	274	959	959	137	822	274	822	1233	274	137	.	5891
1.00 - 1.49	.	137	.	137	411	.	137	.	548	.	137	.	1507
1.50 - 1.99	137	.	.	137	.	.	.	274
2.00 - 2.49	137	.	.	.	137
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	548	959	1096	548	959	1370	1096	2329	685	411	0	

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Table C3
Annual Joint Distribution of H_m versus T_p (All Years*)

Annual 1985-1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	15	60	45	60	118	233	775	417	359	181	296	3	2562	
0.50 - 0.99	8	130	281	417	497	379	1034	710	509	151	246	3	4315	
1.00 - 1.49	.	13	138	389	304	171	299	211	243	15	93	.	1881	
1.50 - 1.99	.	.	10	136	181	75	68	68	125	28	58	.	749	
2.00 - 2.49	.	.	.	10	33	48	43	38	73	15	30	.	290	
2.50 - 2.99	.	.	.	.	3	8	10	8	48	13	20	.	110
3.00 - 3.49	.	.	.	.	3	10	10	23	13	5	8	.	72
3.50 - 3.99	.	.	.	.	.	.	8	3	5	3	3	.	22
4.00 - 4.49	.	.	.	.	.	.	.	.	3	.	5	.	8
4.50 - 4.99	.	.	.	.	.	.	.	.	3	.	.	.	3
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	23	288	424	1012	1139	924	2247	1478	1381	411	759	6		

* 1985 and 1986 data from Gage 640

Table C4
Monthly Joint Distribution of H_{mo} versus T_p (All Years*)

January 1985-1987, Gage 141														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	114	28	.	28	228	684	570	370	142	370	28	2562	
0.50 - 0.99	.	199	228	427	484	370	969	399	541	.	171	.	3788	
1.00 - 1.49	.	28	199	484	427	114	199	199	114	.	28	.	1792	
1.50 - 1.99	.	.	.	256	456	85	114	85	57	.	.	.	1053	
2.00 - 2.49	142	142	142	28	57	.	57	.	568	
2.50 - 2.99	57	.	114	.	.	.	171	
3.00 - 3.49	28	.	.	.	28	
3.50 - 3.99	28	.	.	.	28	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	341	455	1167	1537	939	2165	1281	1309	142	626	28		

February 1985-1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	32	191	191	96	64	159	.	733	
0.50 - 0.99	.	96	64	573	669	446	892	955	828	159	96	32	4810	
1.00 - 1.49	.	.	159	764	605	287	350	414	382	32	318	.	3311	
1.50 - 1.99	.	.	32	127	255	96	32	64	191	.	32	.	829	
2.00 - 2.49	.	.	.	32	.	.	.	32	32	.	.	.	96	
2.50 - 2.99	32	.	32	.	64	
3.00 - 3.49	32	.	.	96	.	.	.	.	128	
3.50 - 3.99	32	.	.	.	.	32	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	96	255	1496	1561	861	1465	1784	1561	255	637	32		

March 1985-1987, Gage 141 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	28	.	.	.	83	138	387	276	276	110	110	.	1408	
0.50 - 0.99	.	55	110	414	525	359	1105	884	470	83	55	.	4060	
1.00 - 1.49	.	28	166	331	552	110	276	387	580	.	28	.	2458	
1.50 - 1.99	.	.	.	138	166	138	166	83	221	.	138	.	1050	
2.00 - 2.49	28	28	55	138	193	.	138	.	580	
2.50 - 2.99	28	110	28	83	.	249	
3.00 - 3.49	28	.	.	.	28	
3.50 - 3.99	28	.	28	28	.	.	84	
4.00 - 4.49	55	.	55	
4.50 - 4.99	28	.	.	.	28	
5.00 - Greater	0	
Total	28	83	276	883	1354	773	2017	1796	1934	249	607	0		

(Continued)

(Sheet 1 of 4)

Table C4 (Continued)

April 1985-1987, Gage 141													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	29	.	.	.	29	58	641	379	496	379	379	.	2390
0.50 - 0.99	.	117	146	321	379	292	1108	875	408	379	379	.	4404
1.00 - 1.49	.	.	29	146	350	87	554	350	87	.	117	.	1720
1.50 - 1.99	.	.	.	117	175	29	87	87	262	58	175	.	990
2.00 - 2.49	.	.	.	29	.	.	.	29	87	.	58	.	203
2.50 - 2.99	58	87	.	.	145
3.00 - 3.49	29	29	29	29	.	116
3.50 - 3.99	29	.	29
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	29	117	175	613	933	486	2390	1749	1427	932	1166	0	

May 1985-1987, Gage 141													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	29	87	29	146	233	175	962	408	233	204	408	.	2914
0.50 - 0.99	.	87	204	321	671	496	1224	612	466	29	233	.	4343
1.00 - 1.49	.	.	29	204	175	175	641	146	58	.	175	.	1603
1.50 - 1.99	.	.	29	58	.	.	87	87	87	87	117	.	552
2.00 - 2.49	29	29	29	29	.	117	58	.	291
2.50 - 2.99	29	.	.	.	58	29	87	.	203
3.00 - 3.49	29	58	.	87
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	29	174	291	729	1137	875	2943	1282	902	495	1136	0	

June 1985-1987, Gage 141													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	58	231	86	144	490	605	1729	548	346	231	231	.	4699
0.50 - 0.99	29	144	375	403	576	346	1239	720	173	259	29	.	4293
1.00 - 1.49	.	.	58	144	202	144	144	58	86	.	.	.	836
1.50 - 1.99	.	.	29	29	29	58	29	.	.	.	.	.	174
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	87	.	548	720	1297	1153	3141	1326	605	490	260	0	

(Continued)

(Sheet 2 of 4)

Table C4 (Continued)

July 1985-1987, Gage 141													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	30	60	151	30	271	753	2349	783	693	422	602	.	6144
0.50 - 0.99	.	271	361	331	151	482	1024	331	151	.	151	.	3253
1.00 - 1.49	.	.	90	120	90	30	30	30	60	.	.	.	450
1.50 - 1.99	30	30	60	30	.	.	.	.	150
2.00 - 2.49	0
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	30	331	602	481	542	1295	3463	1174	904	422	753	0	

August 1985-1987, Gage 141														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	129	97	161	161	258	968	613	516	129	194	.	3226	
0.50 - 0.99	.	290	161	613	742	65	871	484	290	194	323	.	4033	
1.00 - 1.49	.	.	290	516	129	161	452	65	194	32	32	.	1871	
1.50 - 1.99	.	.	.	194	65	65	.	65	65	129	.	.	583	
2.00 - 2.49	32	.	65	129	32	.	.	258	
2.50 - 2.99	32	.	.	.	.	.	32	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	419	548	1484	1097	581	2323	1292	1194	516	549	0		

September 1985-1987, Gage 141														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	31	31	.	157	345	313	815	63	376	.	2131	
0.50 - 0.99	.	94	125	282	439	376	1066	1223	1003	219	345	.	5172	
1.00 - 1.49	.	31	31	251	125	376	470	313	313	.	63	.	1973	
1.50 - 1.99	.	.	.	94	125	251	63	31	63	.	.	.	627	
2.00 - 2.49	31	63	.	.	.	.	.	.	94	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	125	187	658	720	1223	1944	1880	2194	282	784	0		

(Continued)

(Sheet 3 of 4)

Table VI (Continued)

October 1985-1987, Gage 141
Percent Occurrence(X100) of Height and Period

Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	.	53	29	29	87	145	261	29	29	203	.	870
0.50 - 0.99	.	116	348	348	580	522	1246	783	638	58	406	.	5045
1.00 - 1.49	.	29	319	435	145	87	116	319	522	.	.	.	1972
1.50 - 1.99	.	.	29	319	290	58	53	145	261	.	.	.	1160
2.00 - 2.49	87	116	29	29	203	.	.	.	464
2.50 - 2.99	58	29	29	116	.	.	.	232
3.00 - 3.49	58	116	58	.	.	.	.	732
3.50 - 3.99	29	.	.	.	.	.	29
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	145	754	1131	1131	936	1768	1624	1769	87	609	0	

November 1985-1987, Gage 141
Percent Occurrence(X100) of Height and Period

Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	30	60	120	30	180	360	180	150	120	120	.	1350
0.50 - 0.99	30	.	240	330	450	420	1051	480	511	270	420	.	4202
1.00 - 1.49	.	30	270	691	420	420	210	30	180	90	210	.	2551
1.50 - 1.99	.	.	.	210	300	60	90	90	180	.	60	.	990
2.00 - 2.49	.	.	.	60	.	150	240	90	120	.	.	.	660
2.50 - 2.99	30	.	30	.	.	.	.	60
3.00 - 3.49	30	.	60	60	.	.	.	150
3.50 - 3.99	0
4.00 - 4.49	30	.	.	.	30
4.50 - 4.99	0
5.00 - Greater	0
Total	30	60	570	1411	1200	1290	1951	960	1231	480	810	0	

December 1985-1987, Gage 141
Percent Occurrence(X100) of Height and Period

Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	70	.	70	35	105	490	490	315	260	420	.	2275
0.50 - 0.99	35	105	420	699	280	350	490	804	699	175	385	.	4442
1.00 - 1.49	.	70	.	664	420	70	140	210	350	35	175	.	2134
1.50 - 1.99	.	.	.	70	280	35	.	35	105	70	175	.	770
2.00 - 2.49	70	.	.	.	35	35	35	.	175
2.50 - 2.99	70	.	35	.	105
3.00 - 3.49	35	.	35	.	.	.	.	70
3.50 - 3.99	35	.	.	.	.	.	35
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	35	245	420	1503	1085	595	1155	1574	1574	595	1225	0	

(Sheet 4 of 4)

* 1985 and 1986 data from Gage 640

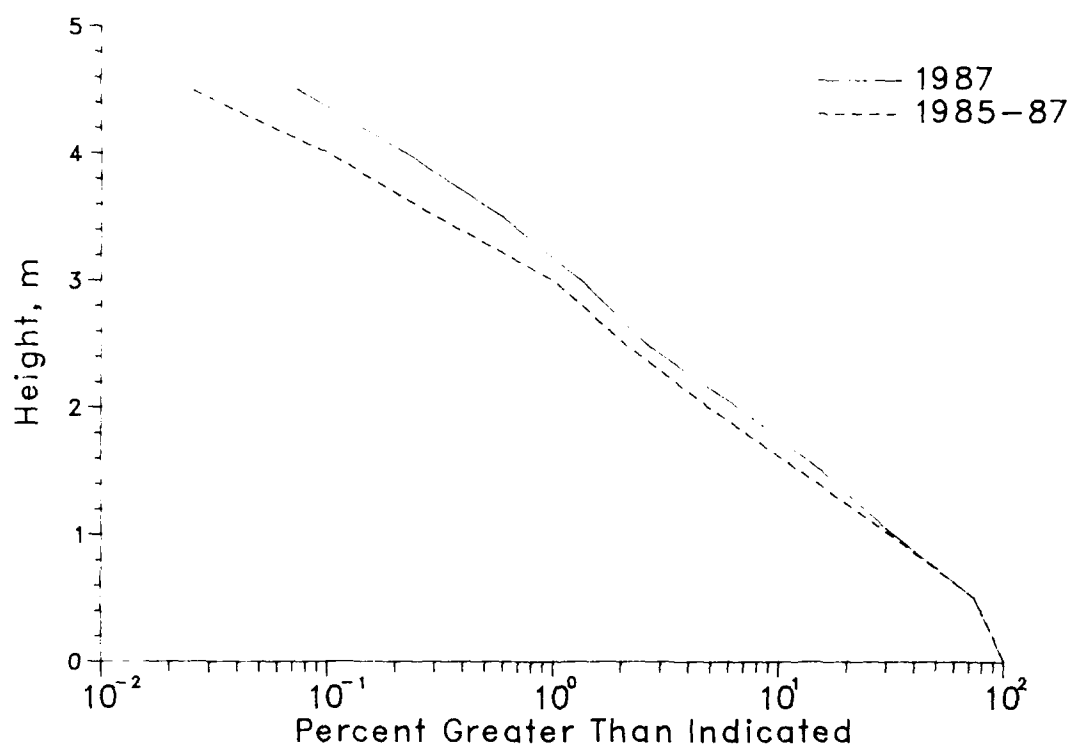


Figure C2. Annual cumulative wave height distributions
for Gage 141 (1985 and 1986 data from Gage 640)

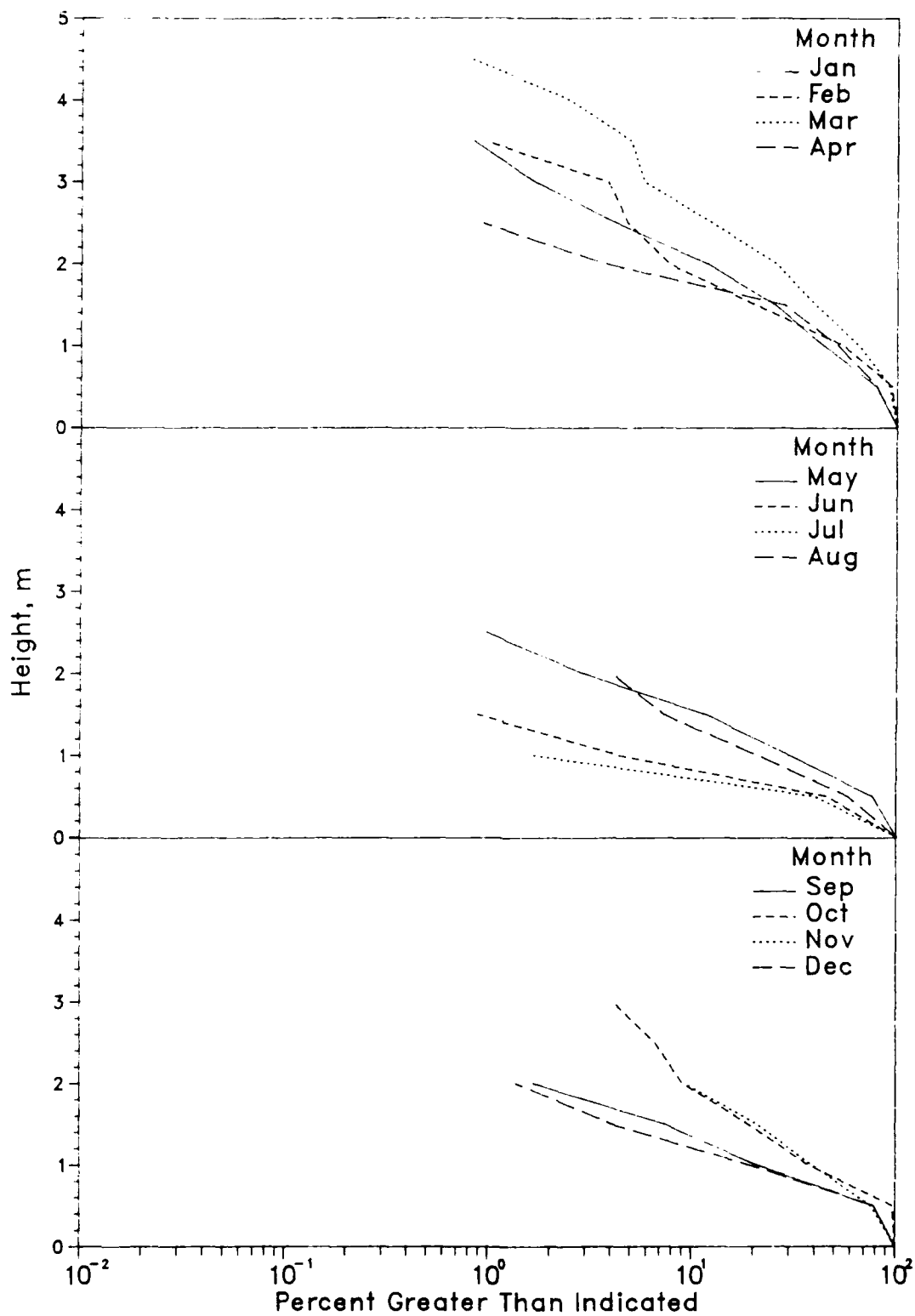


Figure C3. 1987 monthly wave height distributions
for Gage 141

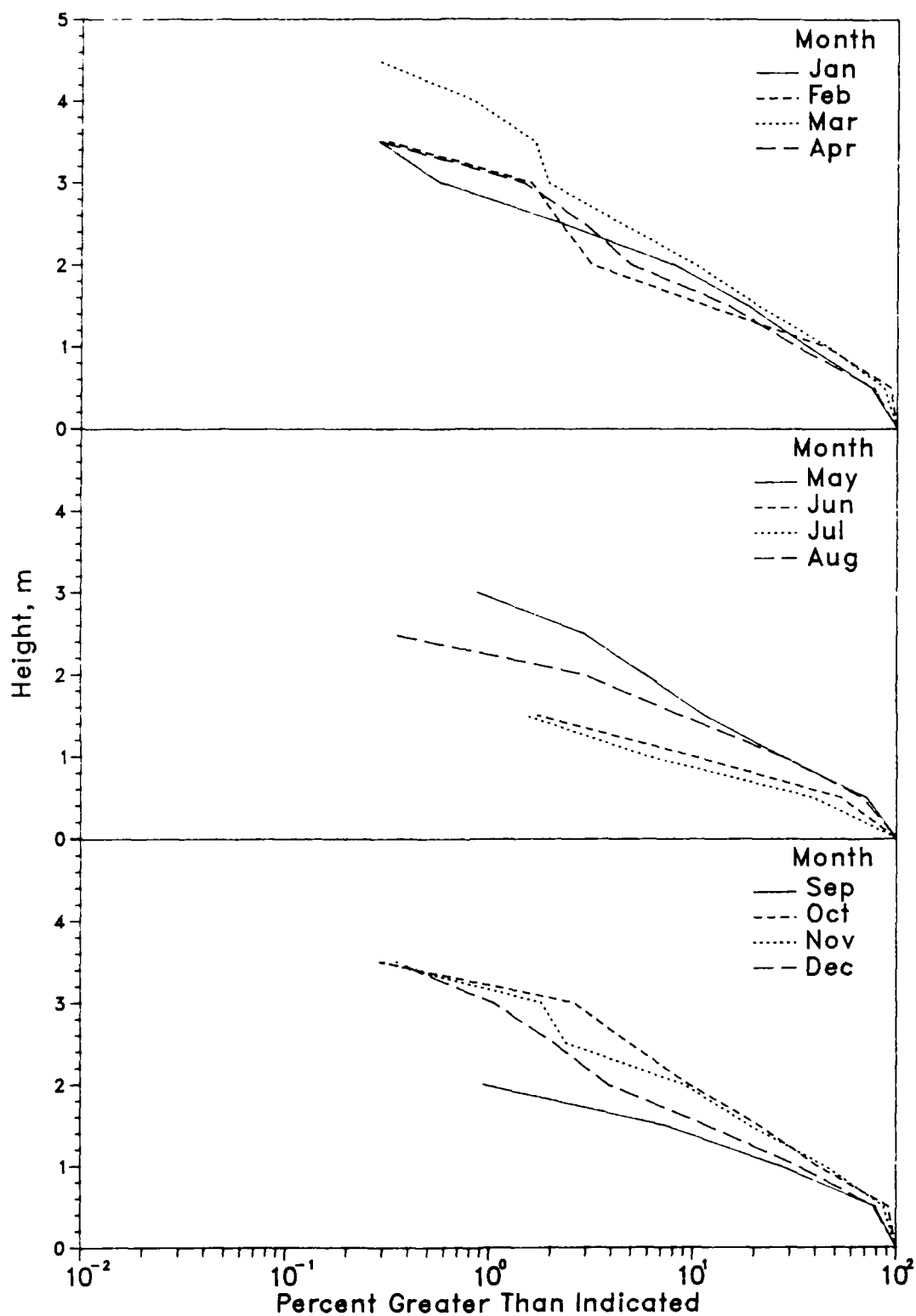


Figure C4. 1985-1987 monthly wave height distributions for Gage 141 (1985 and 1986 data from Gage 640)

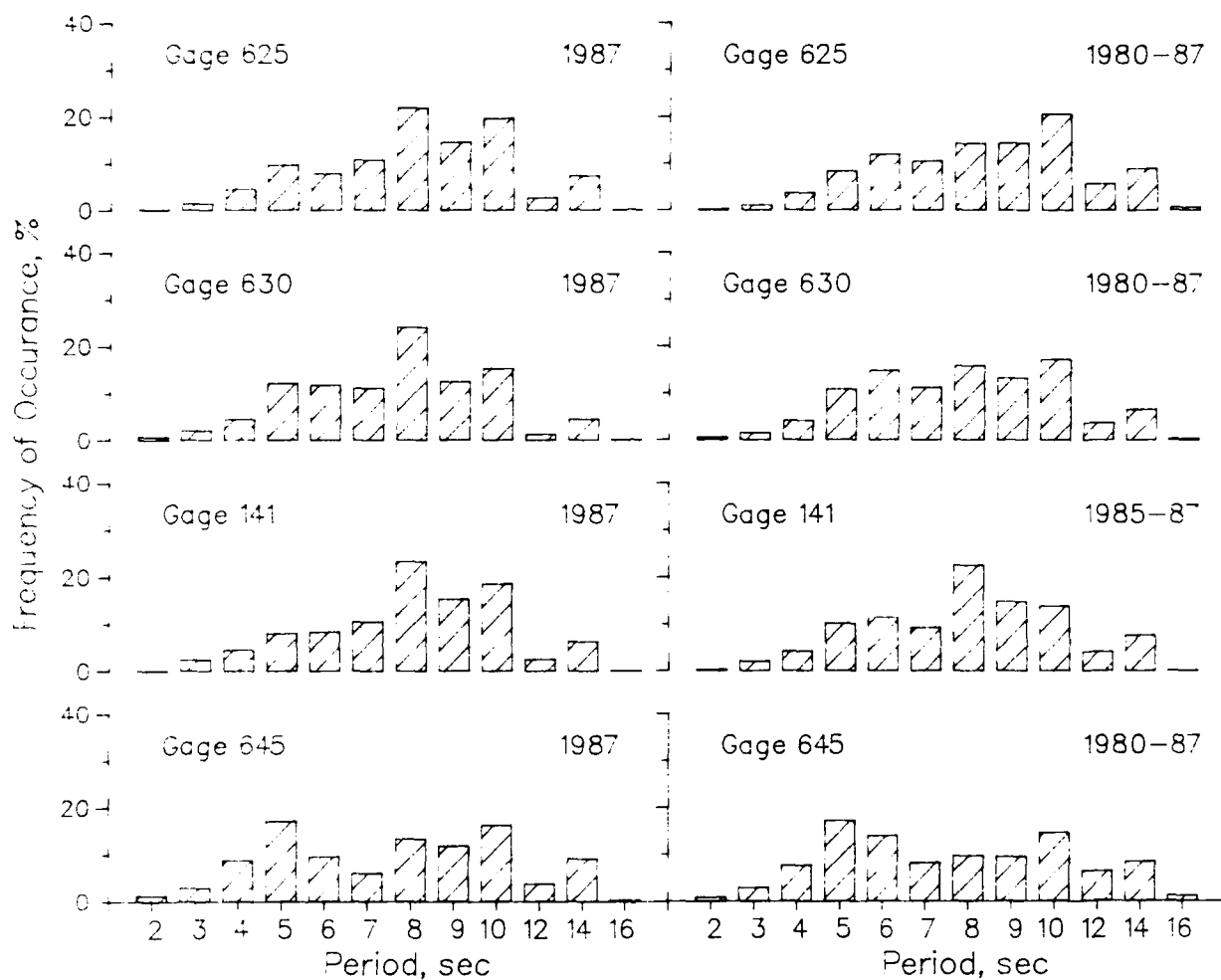


Figure C5. Annual wave period distributions for all gages

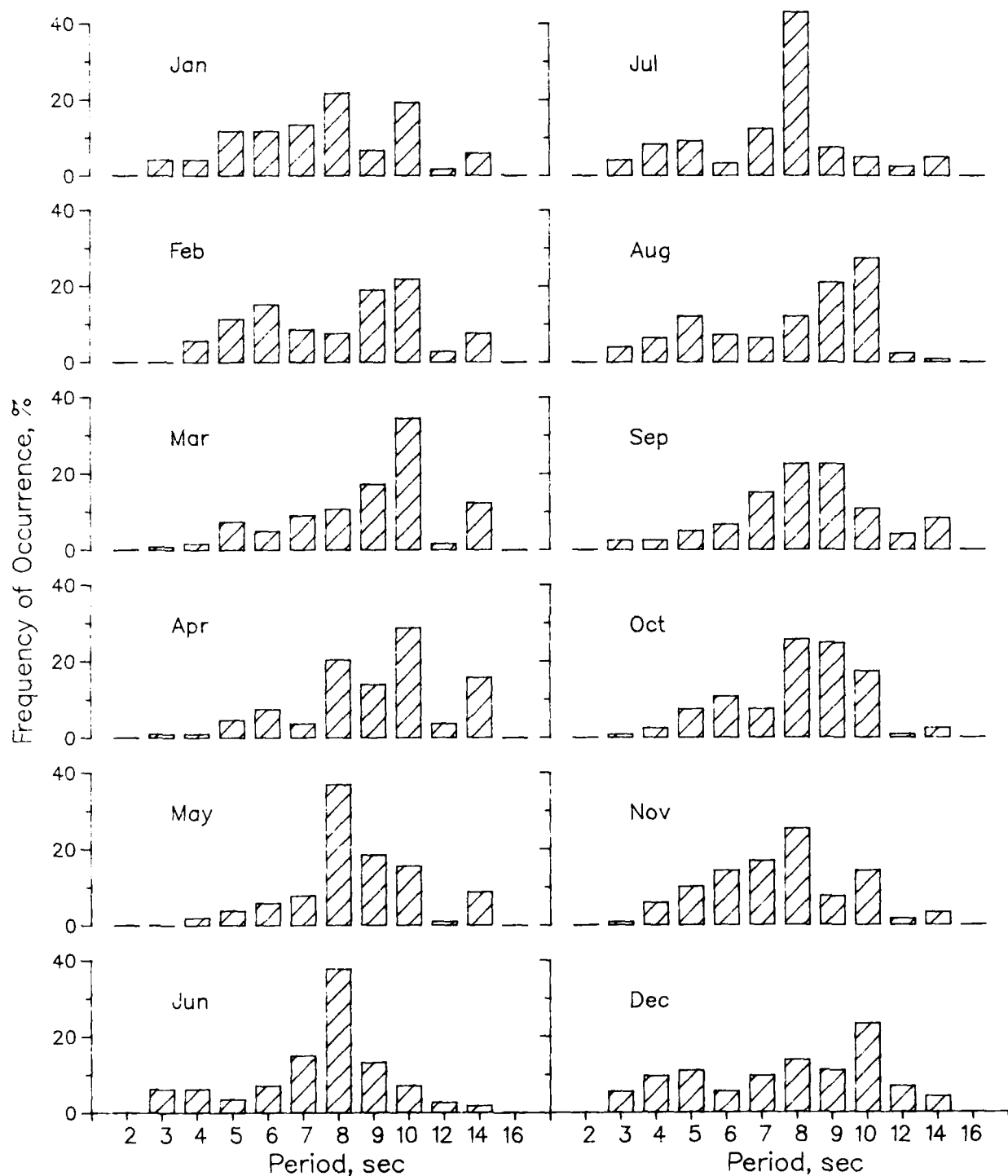


Figure C6. 1987 monthly wave period distributions for Gage 141

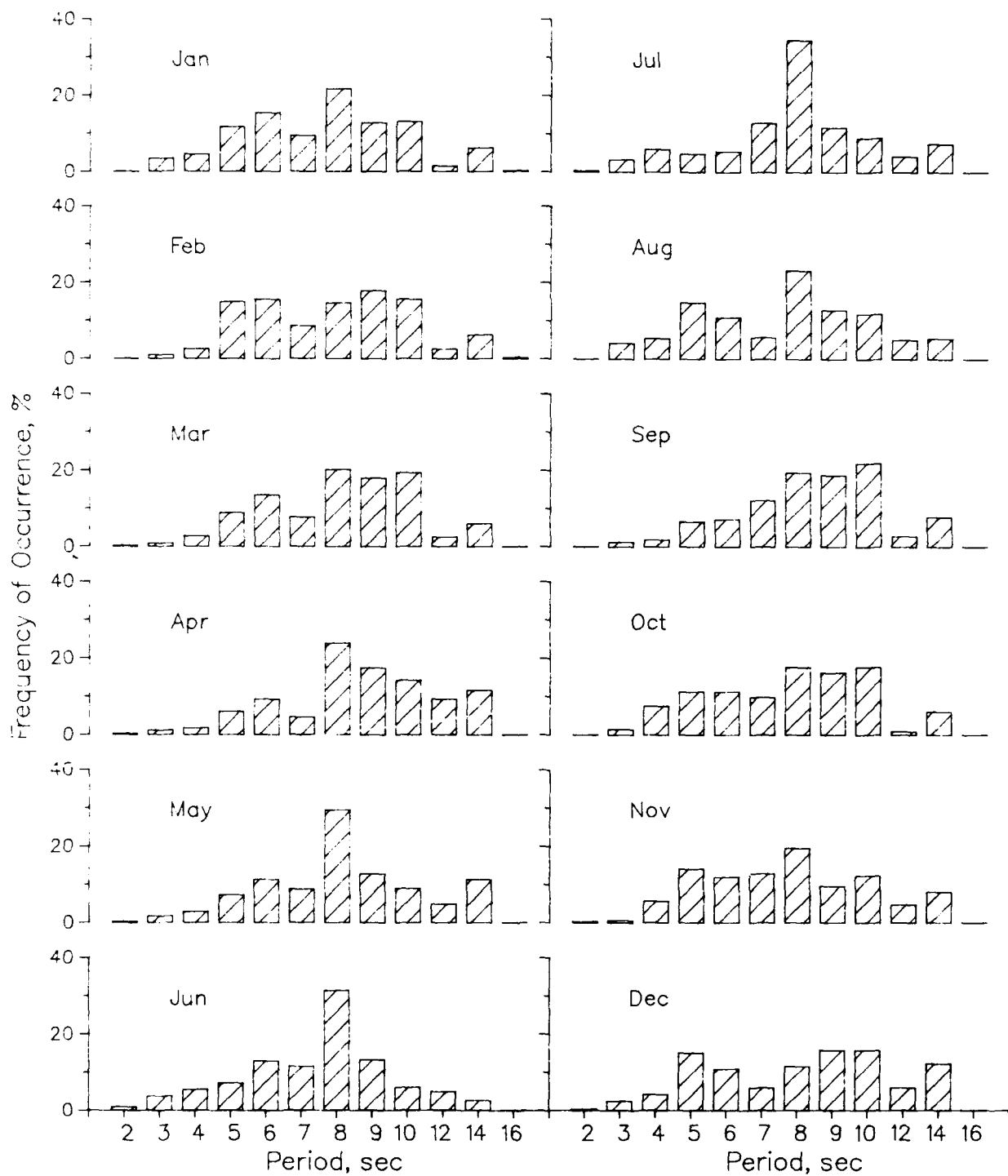


Figure C7. 1985-1987 monthly wave period distributions for Gage 141

Table C5
1987 Persistence of H_{mo} for Gage 141

Height (m)	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	33	30	25	22		19	14	13	12	9	8	6		5	4				
1.0	48	38	21	12	10	8	5	3	2										
1.5	37	21	13	7	3			1											
2.0	17	12	4	2			1												
2.5	8	5	2			1													
3.0	6	2																	
3.5	3	1																	
4.0	1																		

Table C6
1985 through 1987 Persistence of H_{mo} for Gage 141*

Height (m)	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	29	27	23	21		17	14		13		11	9	8		6	5			4
1.0	52	37	23	15	10	8	6	3	2										
1.5	35	19	9	5	2		1												
2.0	15	8	3		1														
2.5	9	4	2																
3.0	6	2																	
3.5	3	1																	
4.0	1																		

* Data from gage 640 from 1985 and 1986 was used in comparison with 1987 gage 141 data

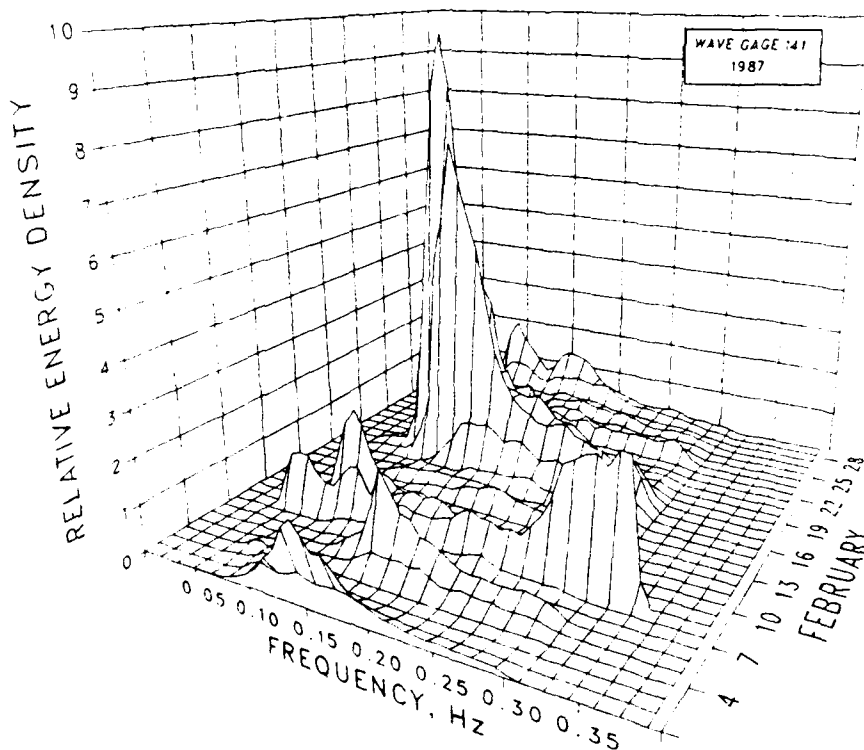
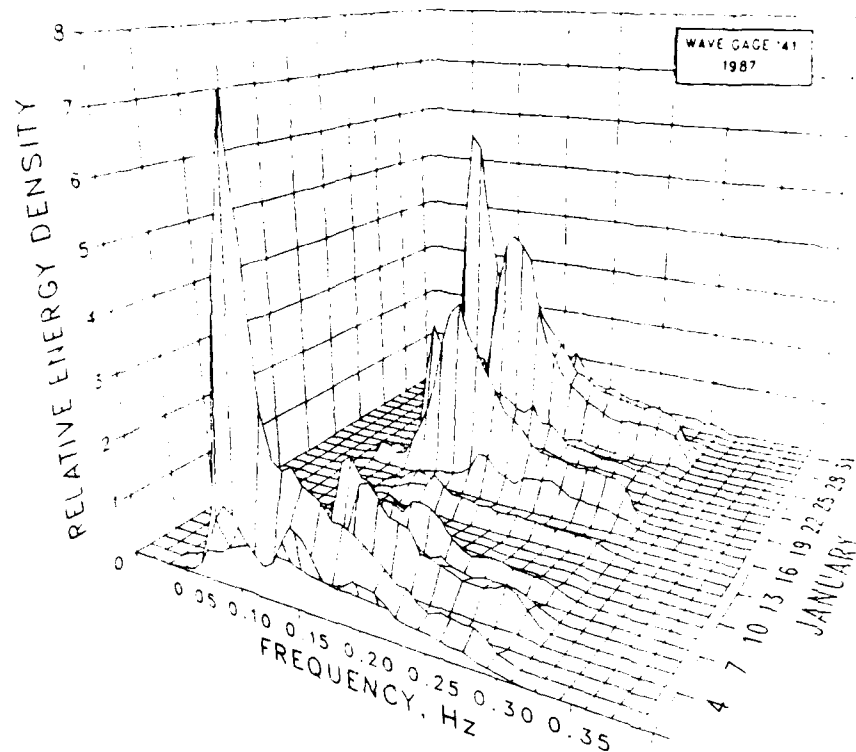


Figure C8. 1987 monthly spectra for Gage 141
(Sheet 1 of 6)

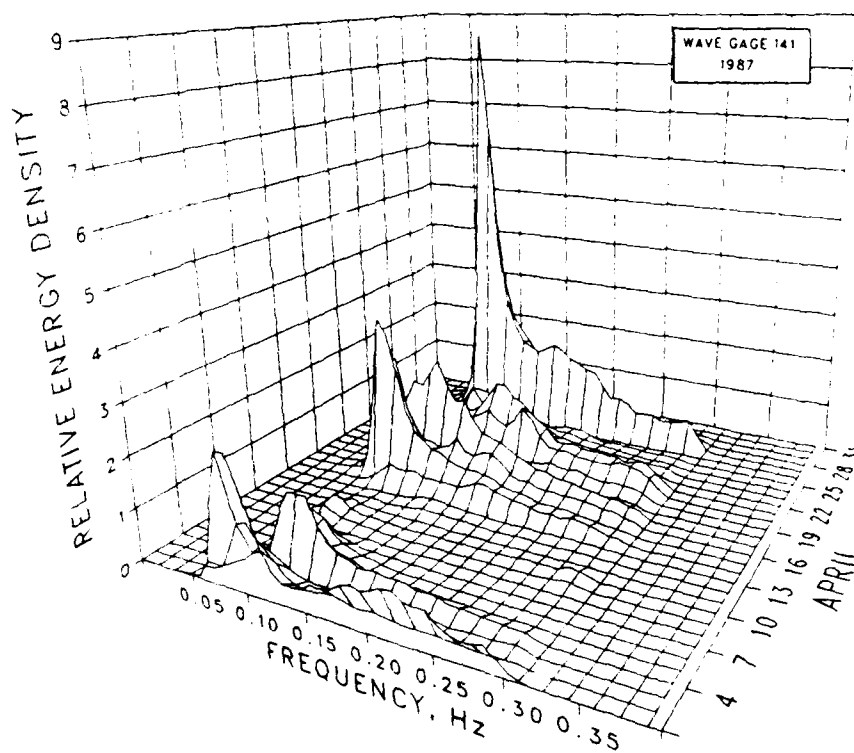
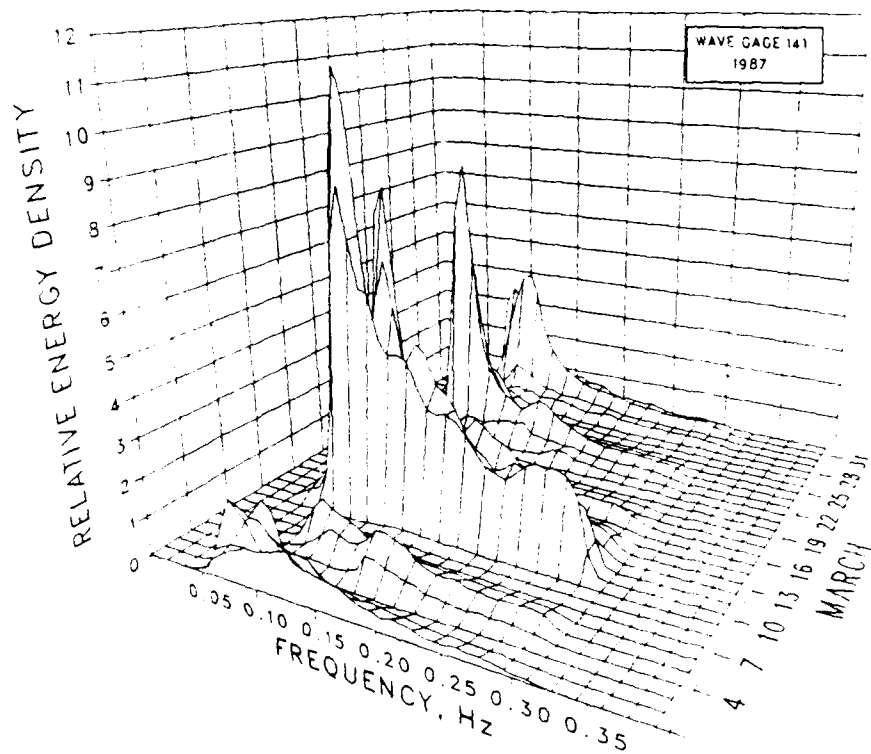


Figure C8. (Sheet 2 of 6)

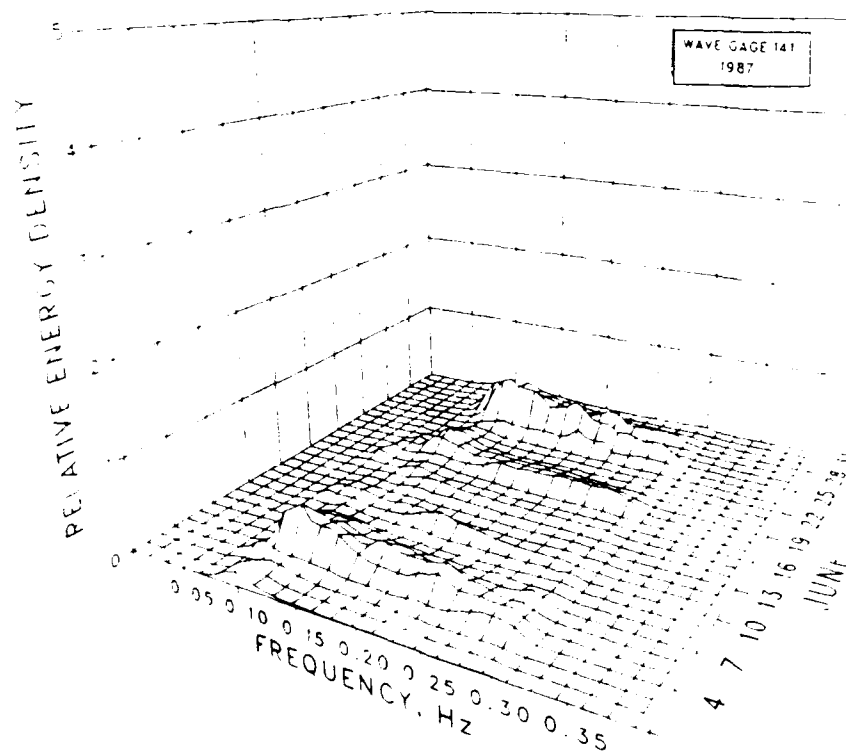
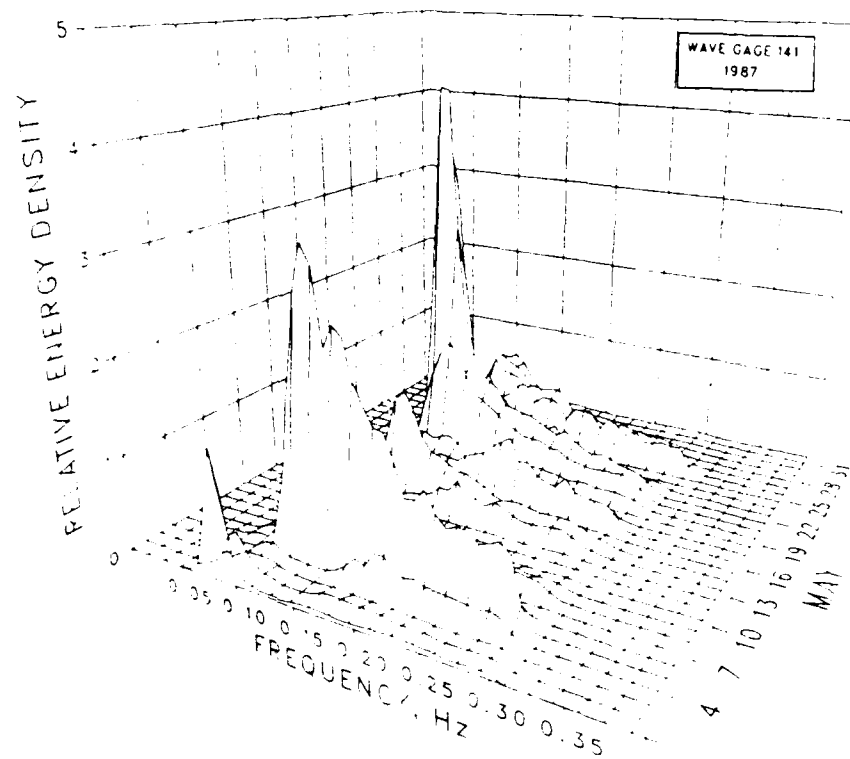


Figure C8. (Sheet 3 of 6)

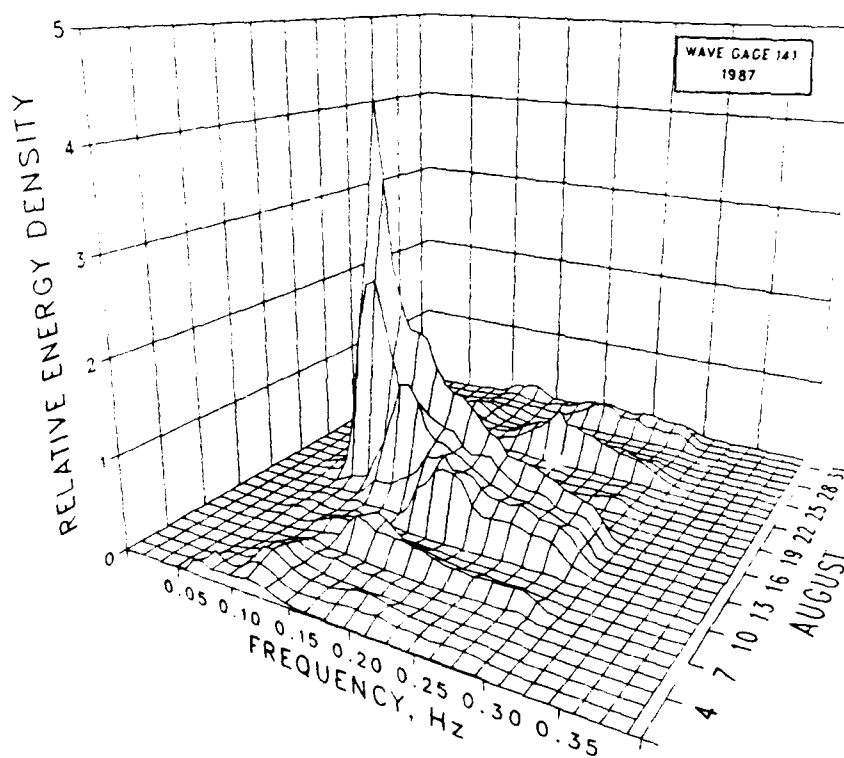
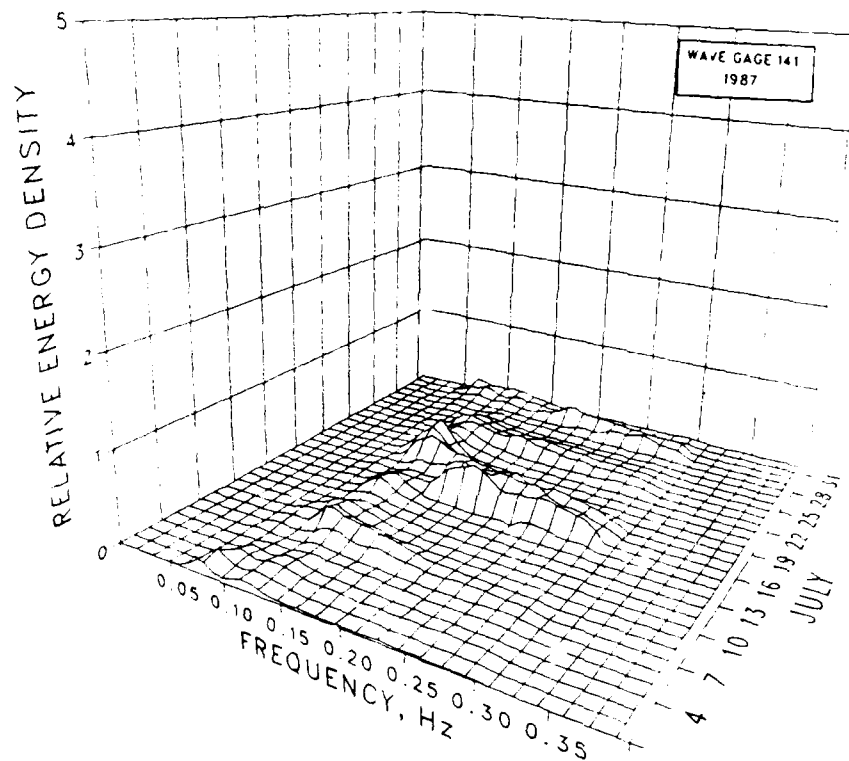


Figure C8. (Sheet 4 of 6)

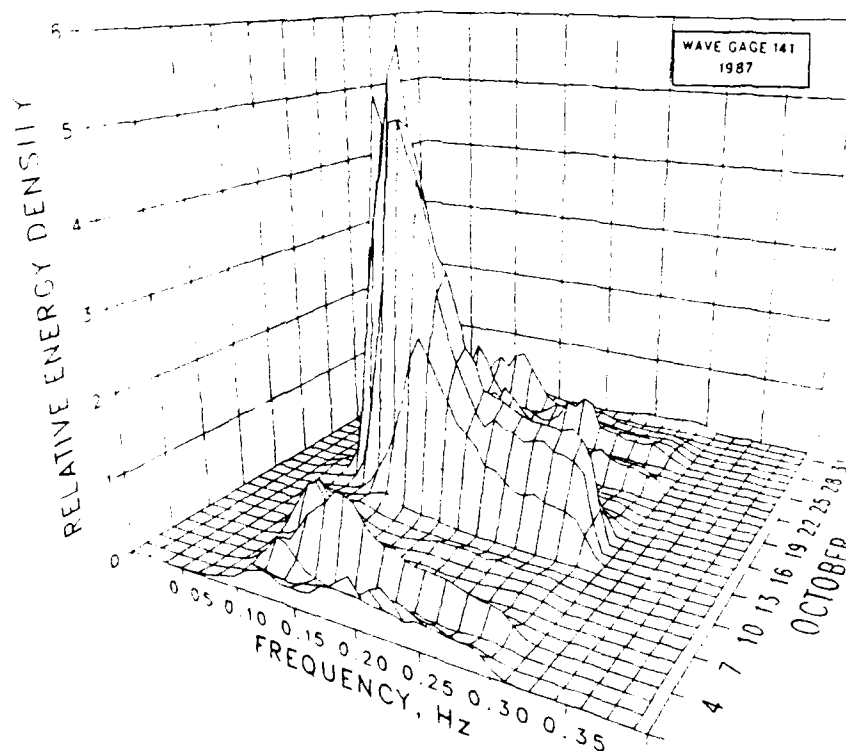
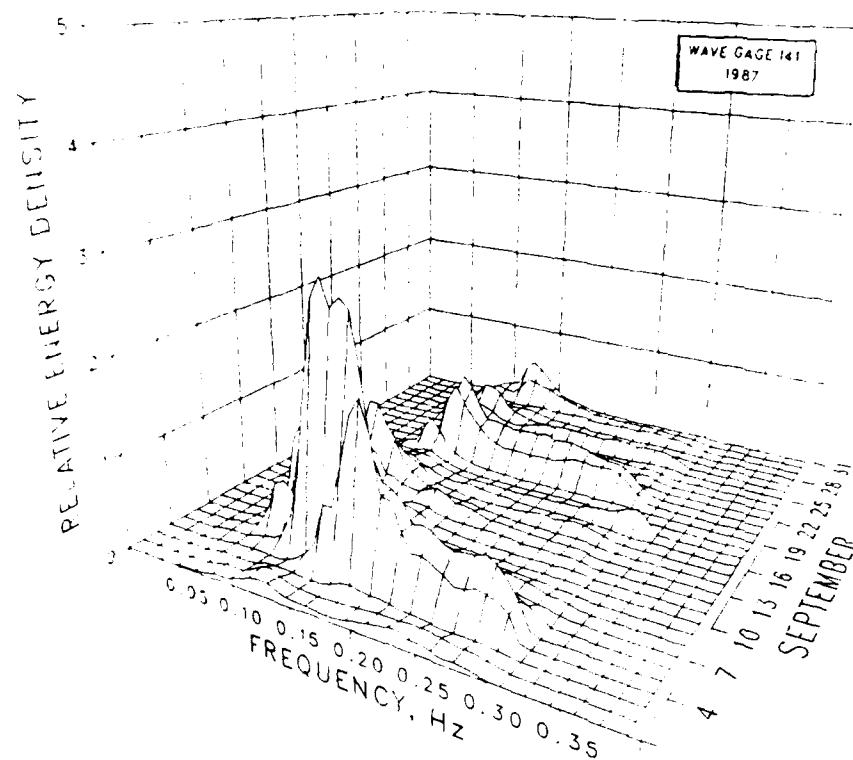


Figure C8. (Sheet 5 of 6)

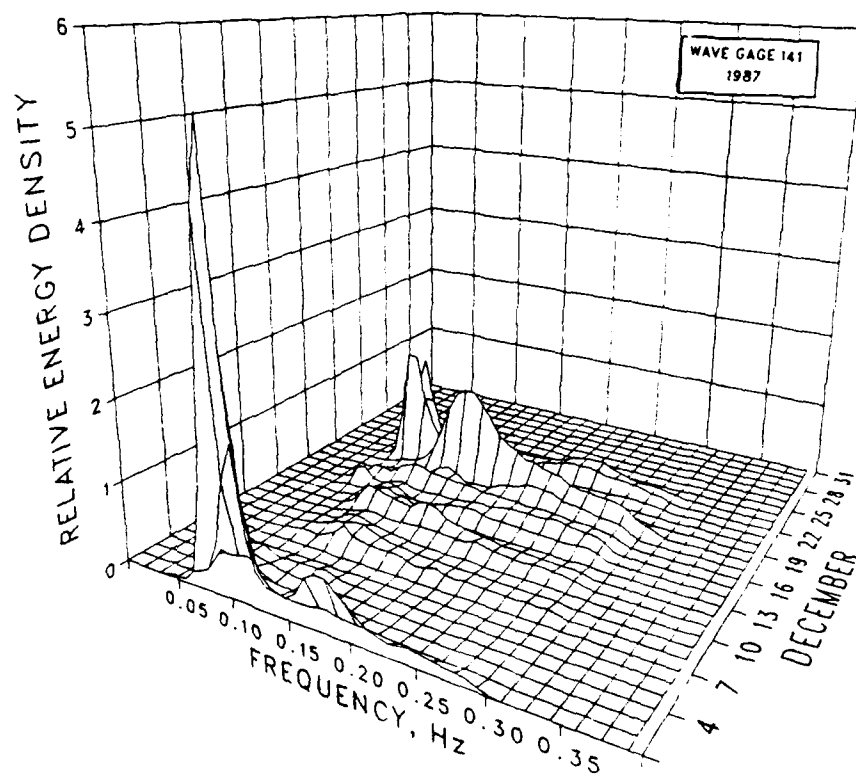
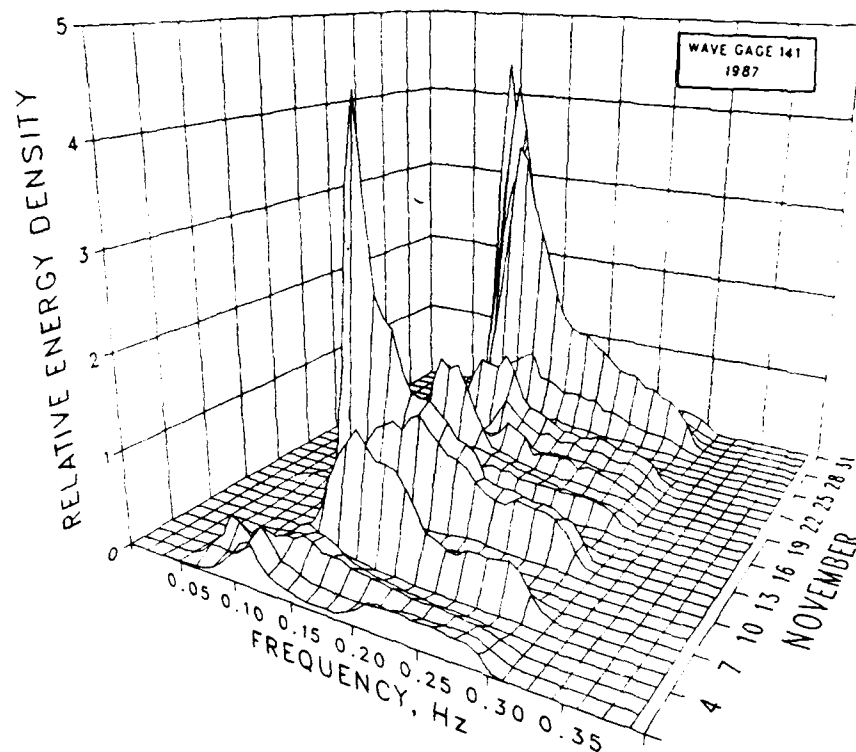


Figure C8. (Sheet 6 of 6)

Table C7
Wave Statistics for Gage 141*

Month	1987							1985-1987						
	Height				Period			Height				Period		
	Std.			Date	Std.		Number	Std.			Date	Std.		Number
	Mean	Dev.	Extreme		Mean	Dev.		Mean	Dev.	Extreme		Mean	Dev.	
	m	m	m		sec	sec		sec	sec	m		m	m		sec	sec	Obs.
Jan	1.1	0.7	3.8	1	8.3	2.5	120	1.0	0.7	3.8	1987	8.3	2.5	351
Feb	1.2	0.7	3.9	17	8.7	2.5	105	1.1	0.6	3.9	1987	8.6	2.6	314
Mar	1.5	1.0	4.5	10	9.6	2.3	122	1.2	0.7	4.5	1987	8.8	2.4	362
Apr	1.1	0.6	2.7	27	9.8	2.2	108	1.0	0.6	3.7	1985	9.6	2.8	343
May	0.9	0.5	2.5	4	9.2	2.1	103	0.9	0.6	3.3	1986	9.0	2.7	343
Jun	0.6	0.3	1.5	24	8.0	2.2	114	0.6	0.3	1.8	1986	8.1	2.5	347
Jul	0.6	0.2	1.2	15	8.0	2.3	121	0.6	0.3	1.9	1985	8.6	2.5	332
Aug	0.8	0.5	2.4	15	8.5	2.5	124	0.8	0.5	2.8	1986	8.3	2.8	310
Sep	0.8	0.5	2.2	5	8.9	2.3	120	0.9	0.4	2.2	1987	9.1	2.3	319
Oct	1.1	0.7	3.2	14	8.6	2.1	121	1.1	0.7	3.5	1985	8.4	2.5	345
Nov	1.0	0.6	2.5	12	8.1	2.2	119	1.1	0.7	4.1	1985	8.5	2.8	333
Dec	0.8	0.4	2.0	1	8.7	3.2	73	0.9	0.6	3.6	1986	9.1	3.2	286
Annual	1.0	0.7	4.5	Mar	8.7	2.4	1350	0.9	0.6	4.5	Mar 1987	8.7	2.7	3985

* 1985-1986 data from Gage 640 (Waverider at same depth)

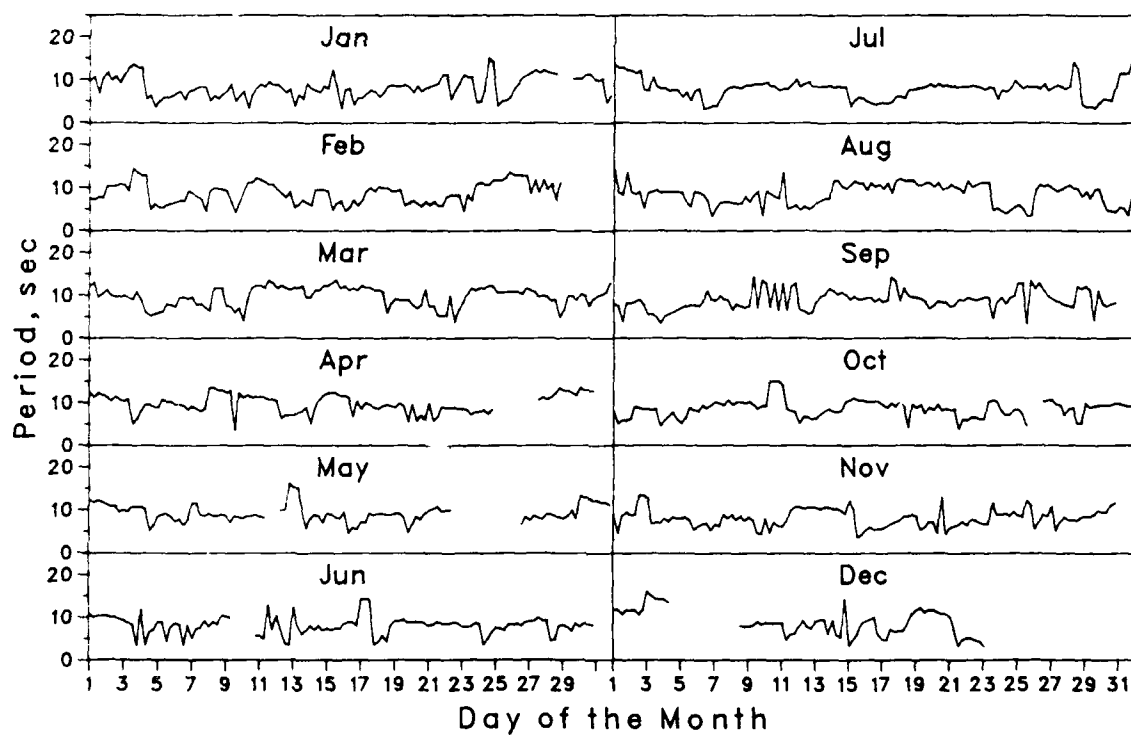
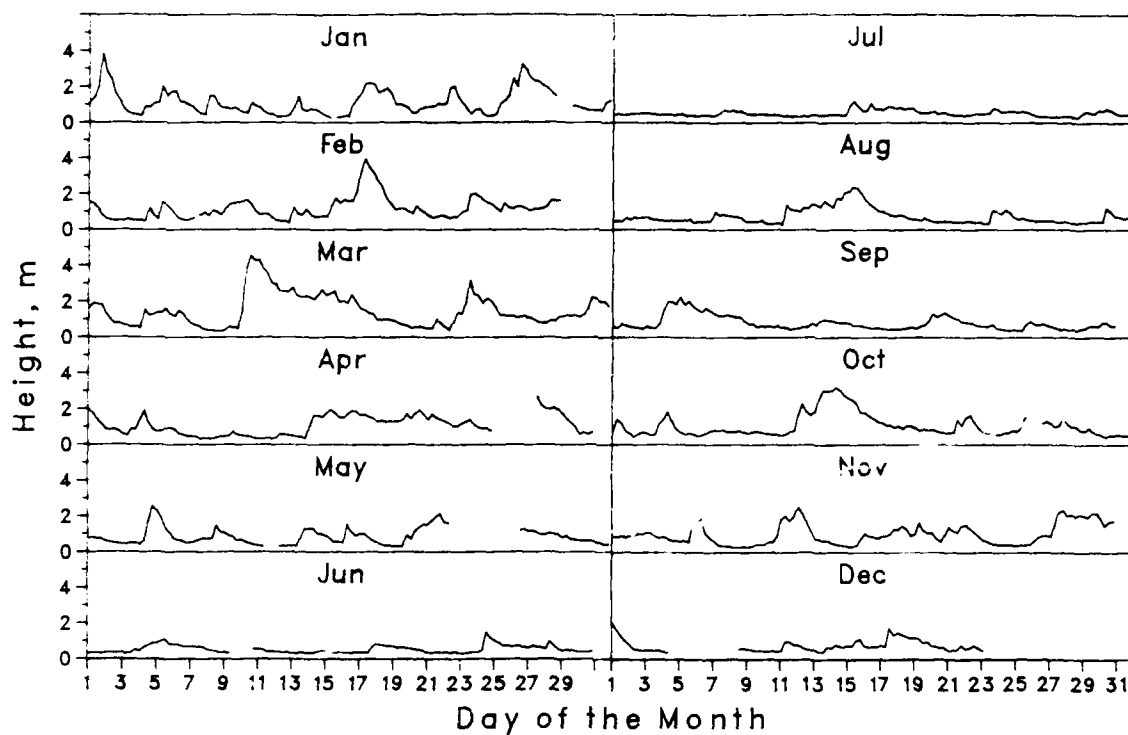


Figure C9. Time-histories of wave height and period for Gage 141

APPENDIX D: WAVE DATA FOR GAGE 625

1. Wave data summaries for Gage 625 are presented for 1987 and for 1980 through 1987 in the following forms:

Daily H_{mo} and T_p

2. Figure D1 displays the individual wave height and peak spectral wave period values along with the monthly mean values.

Joint Distributions of H_{mo} and T_p

3. Annual and monthly joint distributions tables are presented in Tables D1 and D2, and data for 1980 through 1987 are in Tables D3 and D4. Each table gives the frequency (in parts per 10,000) for which the wave height and peak period were within the specified intervals; these values can be converted to percent by dividing by 100. Marginal totals are also included. The row total gives the total number of observations out of 10,000 which fell within each specified peak period interval. The column total gives the number of observations out of 10,000 which fell within each specified wave height interval.

Cumulative Distributions of Wave Height

4. Annual and monthly wave height distributions for 1987 are plotted in cumulative form in Figures D2 and D3. Data for 1980 through 1987 are in Figure D4.

Peak Spectral Wave Period Distributions

5. Annual and monthly peak wave period, T_p , distribution histograms for 1987 are presented in Figures D5 and D6. Data for 1980 through 1987 are in Figure D7.

Persistence of Wave Heights

6. Table D5 shows the number of times in 1987 when the specified wave height was equaled or exceeded at least once during each day for the duration (consecutive days). Data for 1980 through 1987 are given in Table D6. An example is shown below:

Height m	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	18	15		14	13	12		11	10	9				8		7			
1.0	50	34	24	21	18	14	12	8	7	3			2						
1.5	41	19	8	6	2	1													
2.0	22	9	5	1															
2.5	10	5	2																
3.0	6	1																	
3.5		1																	
4.0	1																		

This example indicates that wave heights equaled or exceeded 1.0 m 50 times for at least 1 day; 34 times for at least 2 days; 24 times for at least 3 days, etc. Therefore, on 16 occasions the height equaled or exceeded 1.0 m for 1 day exactly ($50 - 34 = 16$); on 10 occasions for 2 days; on 3 occasions for 3 days, etc. Note that the height exceeded 1 m 50 times for 1 day or longer, while heights exceeded 0.5 m only 18 times for this same duration. This change in durations occurred because the longer durations of lower waves may be interspersed with shorter, but more frequent, intervals of higher waves. For example, one of the times that the wave heights exceeded 0.5 m for 16 days may have represented 3 times the height exceeded 1 m for shorter durations.

Spectra

7. Monthly spectra for the offshore Waverider buoy (Gage 625) are presented in Figure D8. The plots show "relative" energy density as a function of wave frequency. These figures summarize the large number of spectra for each month. The figures emphasize the higher energy density associated with storms as well as the general shifts in energy density to different frequencies. As used here, "relative" indicates the spectra have been smoothed by the 3-D surface drawing routine. Consequently, extremely high- and low-energy density values are modified to produce a smooth surface.

The figures are not intended for quantitative measurements; however, they do provide the energy density as a function of frequency relative to the other spectra for the month.

8. Monthly and annual wave statistics for Gage 625 for 1987 and for 1980 through 1987 are presented in Table D7.

9. Figure D9 plots monthly time histories of wave height and period.

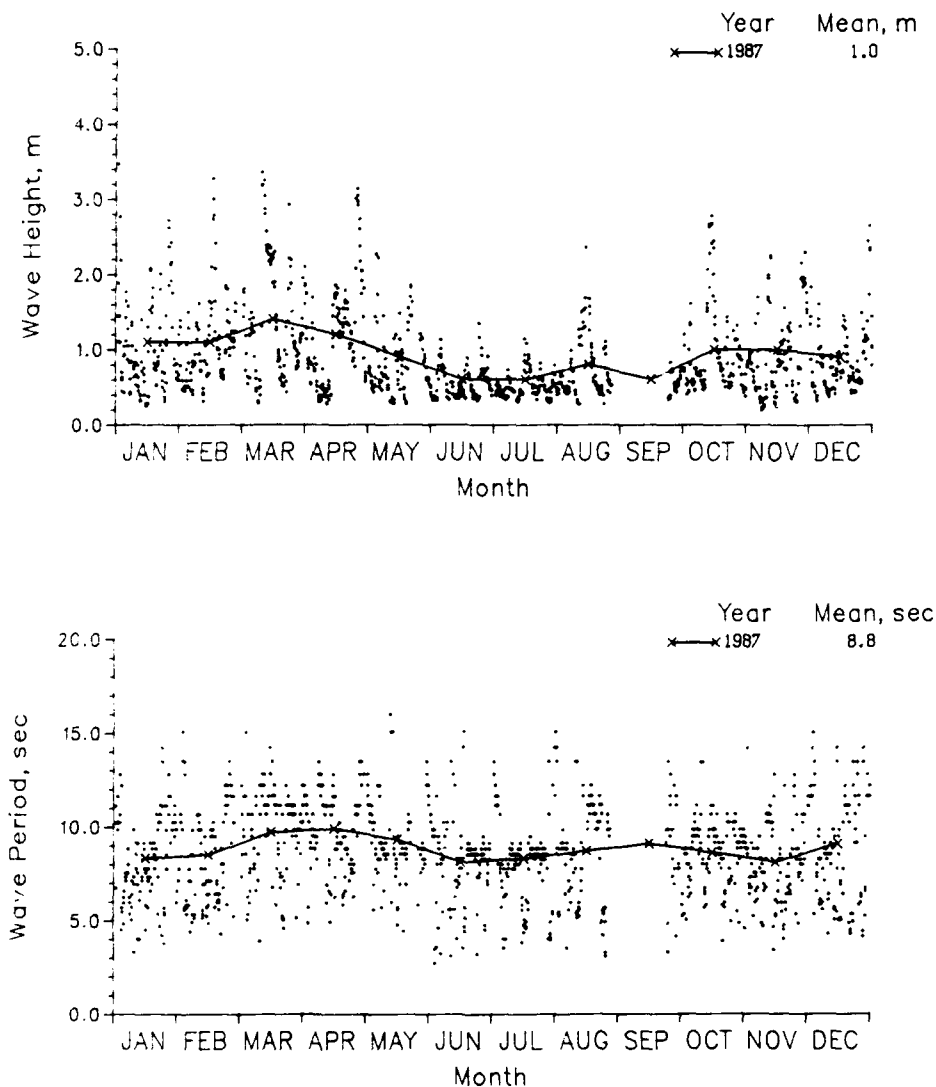


Figure D1. 1987 daily wave period values with monthly means for Gage 625

Table D1

Annual Joint Distribution of H_{mo} versus T_p

Annual 1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	8	23	62	31	100	262	871	393	393	146	239	.	2528
0.50 - 0.99	.	100	278	524	324	432	1010	648	694	69	254	.	4333
1.00 - 1.49	.	15	108	332	239	200	185	239	285	15	100	.	1718
1.50 - 1.99	.	.	.	77	85	93	85	77	293	15	62	.	787
2.00 - 2.49	31	62	8	46	200	23	31	.	401
2.50 - 2.99	23	15	23	62	.	23	.	146
3.00 - 3.49	8	23	31	.	23	.	85
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	8	138	448	964	779	1072	2182	1449	1958	268	732	0	

Table D2
Monthly Joint Distribution of H_{mo} versus T_p

January 1987, Gage 625 Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	84	.	84	420	420	168	168	168	168	.	1680	
0.50 - 0.99	.	168	336	336	420	672	924	588	756	.	84	.	4284	
1.00 - 1.49	.	.	168	588	336	168	.	336	336	.	.	.	1932	
1.50 - 1.99	.	.	.	252	252	168	84	168	168	.	.	.	1008	
2.00 - 2.49	420	.	.	252	.	84	.	756	
2.50 - 2.99	84	168	.	.	.	252	
3.00 - 3.49	84	.	.	.	84	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	168	588	1176	1092	1848	1428	1260	1932	168	336	0		

February 1987, Gage 625 Percent Occurrence(X100) of Height and Period													Total
Height(m)	Period(sec)												
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	.	.	92	.	183	183	183	275	92	.	.	1008
0.50 - 0.99	.	.	275	826	459	550	550	459	550	92	275	.	4036
1.00 - 1.49	.	.	92	826	459	367	.	367	459	92	550	.	3212
1.50 - 1.99	.	.	.	183	92	183	.	92	550	.	.	.	1100
2.00 - 2.49	92	.	.	92	92	.	.	.	276
2.50 - 2.99	92	.	92	.	.	.	.	184
3.00 - 3.49	92	92	.	.	.	.	184
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	0	367	1927	1102	1375	825	1377	1926	276	825	0	

March 1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	82	164	164	82	246	.	.	.	738
0.50 - 0.99	.	.	82	410	82	574	492	656	738	.	82	.	3116
1.00 - 1.49	.	82	.	246	246	410	.	574	984	.	82	.	2624
1.50 - 1.99	164	82	656	82	246	.	1230
2.00 - 2.49	82	.	.	164	984	82	246	.	1558
2.50 - 2.99	82	.	246	.	328
3.00 - 3.49	82	82	.	246	.	410
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	82	82	656	492	1148	820	1640	3772	164	1148	0	

(Continued)

(Sheet 1 of 4)

Table D2 (Continued)

April 1987, Gage 625 Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	.	85	85	.	339	254	678	85	424	.	1950	
0.50 - 0.99	.	.	85	85	169	254	254	424	678	.	678	.	2627	
1.00 - 1.49	.	.	85	.	169	339	678	678	254	.	254	.	2457	
1.50 - 1.99	.	.	.	85	339	85	169	339	593	85	254	.	1949	
2.00 - 2.49	85	85	85	169	.	.	424	
2.50 - 2.99	339	.	.	.	.	339	
3.00 - 3.49	85	169	.	.	.	254	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	0	170	255	762	678	1525	1865	2796	339	1610	0		

May 1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	680	680	680	.	485	.	2525	
0.50 - 0.99	.	.	97	97	388	388	2039	583	680	97	680	.	5049	
1.00 - 1.49	.	.	97	485	.	97	777	97	97	.	.	.	1650	
1.50 - 1.99	97	194	291	.	.	.	582	
2.00 - 2.49	97	97	.	.	.	.	.	.	194	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	0	194	582	485	582	3593	1554	1748	97	1165	0		

June 1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	88	.	88	88	263	439	1930	965	526	263	351	.	5001	
0.50 - 0.99	.	526	351	614	88	526	1842	439	175	.	.	.	4561	
1.00 - 1.49	.	.	88	88	.	175	.	88	.	.	.	.	439
1.50 - 1.99	0	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	88	526	527	790	351	1140	3772	1492	701	263	351	0		

(Continued)

(Sheet 2 of 4)

Table D2 (Continued)

July 1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	83	250	83	250	667	3000	167	500	333	500	.	5833
0.50 - 0.99	.	167	667	583	167	417	1333	333	167	.	167	.	4001
1.00 - 1.49	.	.	83	83	.	.	.	.	.	.	.	.	166
1.50 - 1.99	0
2.00 - 2.49	0
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	250	1000	749	417	1084	4333	500	667	333	667	0	0

August 1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 ~ 0.49	.	98	.	.	.	392	980	588	784	294	.	.	3136
0.50 ~ 0.99	.	196	98	784	392	98	588	784	1275	98	98	.	4411
1.00 ~ 1.49	.	.	294	686	98	98	.	196	392	.	.	.	1764
1.50 ~ 1.99	.	.	.	98	.	98	.	.	294	.	98	.	588
2.00 ~ 2.49	98	.	.	.	98
2.50 ~ 2.99	0
3.00 ~ 3.49	0
3.50 ~ 3.99	0
4.00 ~ 4.49	0
4.50 ~ 4.99	0
5.00 ~ Greater	0
Total	0	294	392	1568	490	686	1568	1568	2843	392	196	0	

September 1987, Gage 625													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	385	1154	.	1154	.	385	385	.	3463
0.50 - 0.99	.	385	769	.	.	1154	769	769	1923	.	769	.	6538
1.00 - 1.49	0
1.50 - 1.99	0
2.00 - 2.49	0
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	385	769	0	385	2308	769	1923	1923	385	1154	0	

(Continued)

(Sheet 3 of 4)

Table D2 (Concluded)

October 1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	413	496	165	83	.	.	1157	
0.50 - 0.99	.	.	83	331	248	579	1818	1901	661	83	.	.	5704	
1.00 - 1.49	.	83	83	331	413	.	165	331	248	.	.	.	1654	
1.50 - 1.99	.	.	.	165	165	83	.	.	165	.	.	.	578	
2.00 - 2.49	83	83	.	83	248	.	.	.	497	
2.50 - 2.99	165	165	83	.	.	.	.	413	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	83	166	827	909	910	2561	2894	1487	166	0	0		

November 1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	84	168	.	252	336	924	336	252	.	336	.	2688	
0.50 - 0.99	.	.	420	588	924	252	924	252	588	84	84	.	4116	
1.00 - 1.49	.	.	84	336	252	336	336	.	.	.	.	.	1344
1.50 - 1.99	.	.	.	84	84	336	420	84	504	.	.	.	1512	
2.00 - 2.49	84	.	.	252	.	.	.	336	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	84	672	1008	1512	1344	2604	672	1596	84	420	0		

December 1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	.	81	.	.	81	726	323	242	242	323	.	2018
0.50 - 0.99	.	.	403	1210	323	242	484	645	1129	323	565	.	5324
1.00 - 1.49	.	.	161	161	645	242	161	.	403	81	242	.	2096
1.50 - 1.99	81	.	.	81	.	81	.	243
2.00 - 2.49	81	161	.	.	.	242
2.50 - 2.99	81	.	.	.	81
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	0	645	1371	968	646	1371	1049	2097	646	1211	0	

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Table D3
Annual Joint Distribution of H_{mo} versus T_p (All Years)

Annual 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	9	23	38	48	105	198	438	389	402	200	234	15	2099
0.50 - 0.99	5	79	244	410	478	426	683	721	934	199	298	34	4511
1.00 - 1.49	.	5	85	305	376	243	198	187	405	46	160	3	2013
1.50 - 1.99	.	.	2	68	185	121	58	65	155	48	90	6	798
2.00 - 2.49	.	.	.	2	38	46	21	39	91	46	55	2	340
2.50 - 2.99	.	.	.	.	4	15	24	27	46	23	39	2	180
3.00 - 3.49	.	.	.	.	.	.	4	7	17	7	13	.	48
3.50 - 3.99	.	.	.	.	.	.	.	.	3	1	3	.	7
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	14	107	369	833	1186	1049	1426	1435	2053	570	892	62	

Table D4
Monthly Joint Distribution of H_{mo} versus T_p (All Years)

January 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period															Total
Height(m)	Period(sec)														
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer			
0.00 - 0.49	12	36	73	48	109	170	327	303	327	133	109	12	1659		
0.50 - 0.99	.	145	291	388	461	315	521	412	861	145	303	12	3854		
1.00 - 1.49	.	.	85	509	655	242	194	158	448	.	73	.	2364		
1.50 - 1.99	.	.	.	97	279	279	85	133	206	24	36	.	1139		
2.00 - 2.49	73	194	12	48	206	61	109	.	703		
2.50 - 2.99	12	12	36	36	73	36	36	.	241		
3.00 - 3.49	12	12	.	.	.	24		
3.50 - 3.99	12	.	.	.	12		
4.00 - 4.49	0		
4.50 - 4.99	0		
5.00 - Greater	0		
Total	12	181	449	1042	1589	1212	1175	1102	2145	399	666	24			

February 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period															Total
Height(m)	Period(sec)														
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer			
0.00 - 0.49	.	.	.	25	25	62	123	148	271	111	123	.	888		
0.50 - 0.99	12	37	111	370	395	370	666	629	1196	86	284	12	4168		
1.00 - 1.49	.	.	123	395	456	308	234	247	727	86	259	.	2835		
1.50 - 1.99	.	.	.	148	271	136	62	123	271	111	111	.	1233		
2.00 - 2.49	25	49	37	62	86	86	111	.	456		
2.50 - 2.99	12	25	37	99	25	123	.	321		
3.00 - 3.49	12	12	49	.	12	.	85		
3.50 - 3.99	12	.	12		
4.00 - 4.49	0		
4.50 - 4.99	0		
5.00 - Greater	0		
Total	12	37	234	938	1172	937	1159	1258	2699	505	1035	12			

March 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	11	.	.	23	45	57	239	170	227	125	136	.	1033	
0.50 - 0.99	11	57	216	466	466	466	693	568	898	148	330	.	4319	
1.00 - 1.49	.	11	91	284	330	330	193	284	693	45	420	.	2681	
1.50 - 1.99	.	.	.	80	148	91	91	91	261	80	193	11	1046	
2.00 - 2.49	.	.	.	11	68	34	34	23	193	91	80	.	534	
2.50 - 2.99	.	.	.	.	.	11	34	.	80	57	57	.	239
3.00 - 3.49	.	.	.	.	.	.	23	11	45	23	45	.	147
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	22	68	307	884	1057	989	1307	1147	2397	569	1261	11		

(Continued)

(Sheet 1 of 4)

Table D4 (Continued)

April 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	25	12	12	25	74	74	454	282	380	233	331	.	1902	
0.50 - 0.99	.	37	135	221	196	393	798	883	1411	270	491	12	4847	
1.00 - 1.49	.	.	86	172	307	294	270	245	442	49	209	.	2074	
1.50 - 1.99	.	.	.	37	123	61	61	123	209	25	123	.	762	
2.00 - 2.49	.	.	.	12	12	.	25	25	86	25	12	.	197	
2.50 - 2.99	25	12	25	61	49	.	.	172	
3.00 - 3.49	12	25	.	12	.	49	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	25	49	233	467	712	847	1620	1595	2614	651	1178	12		

May 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	11	33	33	33	221	210	619	487	365	111	265	.	2388	
0.50 - 0.99	.	144	243	442	619	476	1206	1084	841	88	243	11	5397	
1.00 - 1.49	.	.	33	144	166	199	376	166	299	22	122	.	1527	
1.50 - 1.99	.	.	.	55	55	11	55	44	66	22	100	.	408	
2.00 - 2.49	33	33	.	11	.	55	33	11	176	
2.50 - 2.99	33	33	22	.	88	
3.00 - 3.49	11	.	11	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	11	177	309	674	1094	929	2256	1792	1604	331	796	22		

June 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	55	82	109	109	342	492	1120	601	505	123	109	14	3661	
0.50 - 0.99	14	178	342	492	369	587	1066	1107	765	150	55	27	5152	
1.00 - 1.49	.	.	27	123	123	137	164	150	232	.	14	.	970	
1.50 - 1.99	.	.	.	41	41	41	.	.	55	.	27	.	205	
2.00 - 2.49	.	.	.	.	.	14	.	.	.	.	.	.	14
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	69	260	478	765	875	1271	2350	1858	1557	273	205	41		

(Continued)

(Sheet 2 of 4)

Table D4 (Continued)

July 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	61	138	92	199	551	1133	1026	904	413	429	31	4977
0.50 - 0.99	.	107	352	383	582	567	674	704	429	291	107	107	4303
1.00 - 1.49	.	.	61	199	184	77	46	46	.	.	15	.	628
1.50 - 1.99	31	31	31	.	.	.	.	.	93
2.00 - 2.49	0
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	168	551	674	996	1226	1884	1776	1333	704	551	138	

August 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 ~ 0.49	.	28	14	42	166	443	665	873	693	360	208	14	3506	
0.50 ~ 0.99	28	111	222	512	665	679	845	817	582	194	194	42	4891	
1.00 ~ 1.49	.	.	69	249	249	180	152	55	83	.	.	.	1037	
1.50 ~ 1.99	.	.	.	42	125	55	14	14	55	14	42	.	361	
2.00 ~ 2.49	14	14	.	42	42	.	69	.	139	
2.50 ~ 2.99	14	14	14	.	.	.	42	
3.00 ~ 3.49	14	14	.	.	.	28	
3.50 ~ 3.99	0	
4.00 ~ 4.49	0	
4.50 ~ 4.99	0	
5.00 ~ Greater	0	
Total	28	139	305	845	1219	1371	1690	1787	1483	568	513	56		

September 1980-1987, Gage 625 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	.	15	30	104	104	342	565	297	238	89	1784	
0.50 - 0.99	.	30	238	253	535	357	342	788	1278	208	401	.	4430	
1.00 - 1.49	.	.	45	253	446	297	253	357	639	74	208	.	2572	
1.50 - 1.99	.	.	.	104	223	178	59	89	119	59	45	.	876	
2.00 - 2.49	30	15	30	15	30	45	.	185	
2.50 - 2.99	15	15	30	59	.	45	.	164	
3.00 - 3.49	15	.	.	.	15	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	30	283	625	1234	981	788	1636	2690	668	982	89		

(Continued)

(Sheet 3 of 4)

Table D4 (Concluded)

October 1980-1987, Gage 625
Percent Occurrence(X100) of Height and Period

Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	.	22	43	11	130	260	216	260	65	216	22	1745
0.50 - 0.99	.	65	194	280	400	335	498	617	1136	216	292	43	4046
1.00 - 1.49	.	11	119	400	390	216	97	227	530	76	206	22	2294
1.50 - 1.99	.	.	22	97	292	97	43	65	271	76	173	32	1168
2.00 - 2.49	108	87	65	152	173	76	54	11	726
2.50 - 2.99	22	65	76	65	32	22	87	22	391
3.00 - 3.49	11	.	.	43	43	.	97
3.50 - 3.99	22	11	.	.	33
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	76	347	800	1223	930	1050	1342	2424	585	1071	152	

November 1980-1987, Gage 625
Percent Occurrence(X100) of Height and Period

Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	11	56	90	45	147	192	147	203	214	327	.	1432
0.50 - 0.99	.	23	350	429	621	384	553	508	711	327	384	34	4324
1.00 - 1.49	.	34	147	406	609	339	226	158	293	124	135	11	2482
1.50 - 1.99	.	.	.	45	282	237	147	45	135	113	79	23	1106
2.00 - 2.49	45	34	34	11	90	68	79	.	361
2.50 - 2.99	11	34	45	23	34	45	.	192
3.00 - 3.49	11	34	11	23	.	79
3.50 - 3.99	23	.	23
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	68	553	970	1602	1152	1186	925	1489	891	1095	68	

December 1980-1987, Gage 625
Percent Occurrence(X100) of Height and Period

Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	.	23	23	35	47	82	246	317	352	317	328	23	1793
0.50 - 0.99	.	23	270	692	457	258	328	610	1008	281	422	117	4466
1.00 - 1.49	.	.	106	457	528	246	141	129	363	59	188	.	2217
1.50 - 1.99	.	.	.	59	293	211	23	35	141	23	94	.	879
2.00 - 2.49	47	47	12	82	141	35	47	.	411
2.50 - 2.99	12	23	23	59	70	.	35	.	222
3.00 - 3.49	12	.	.	.	.	12
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	0	46	399	1243	1384	867	773	1244	2075	715	1114	140	

(Sheet 4 of 4)

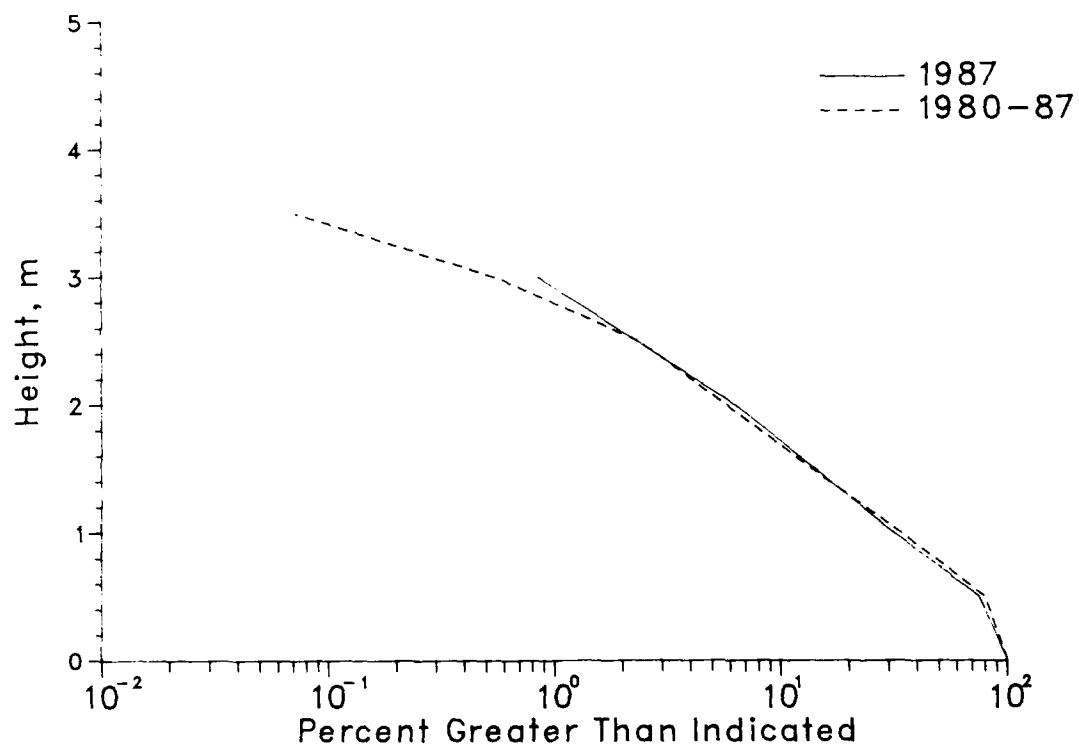


Figure D2. Annual cumulative wave height distributions
for Gage 625

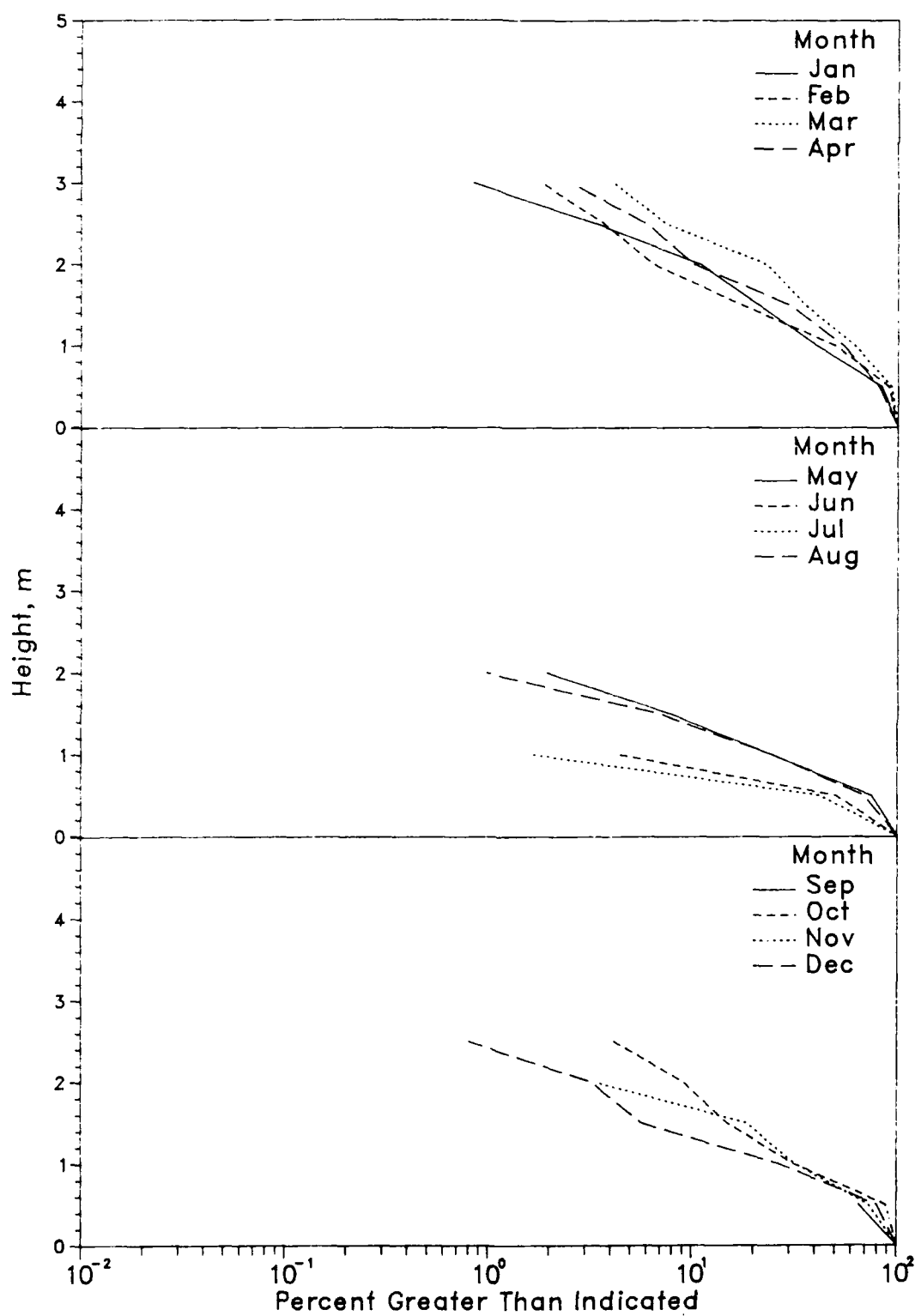


Figure D3. 1987 monthly wave height distributions
for Gage 625

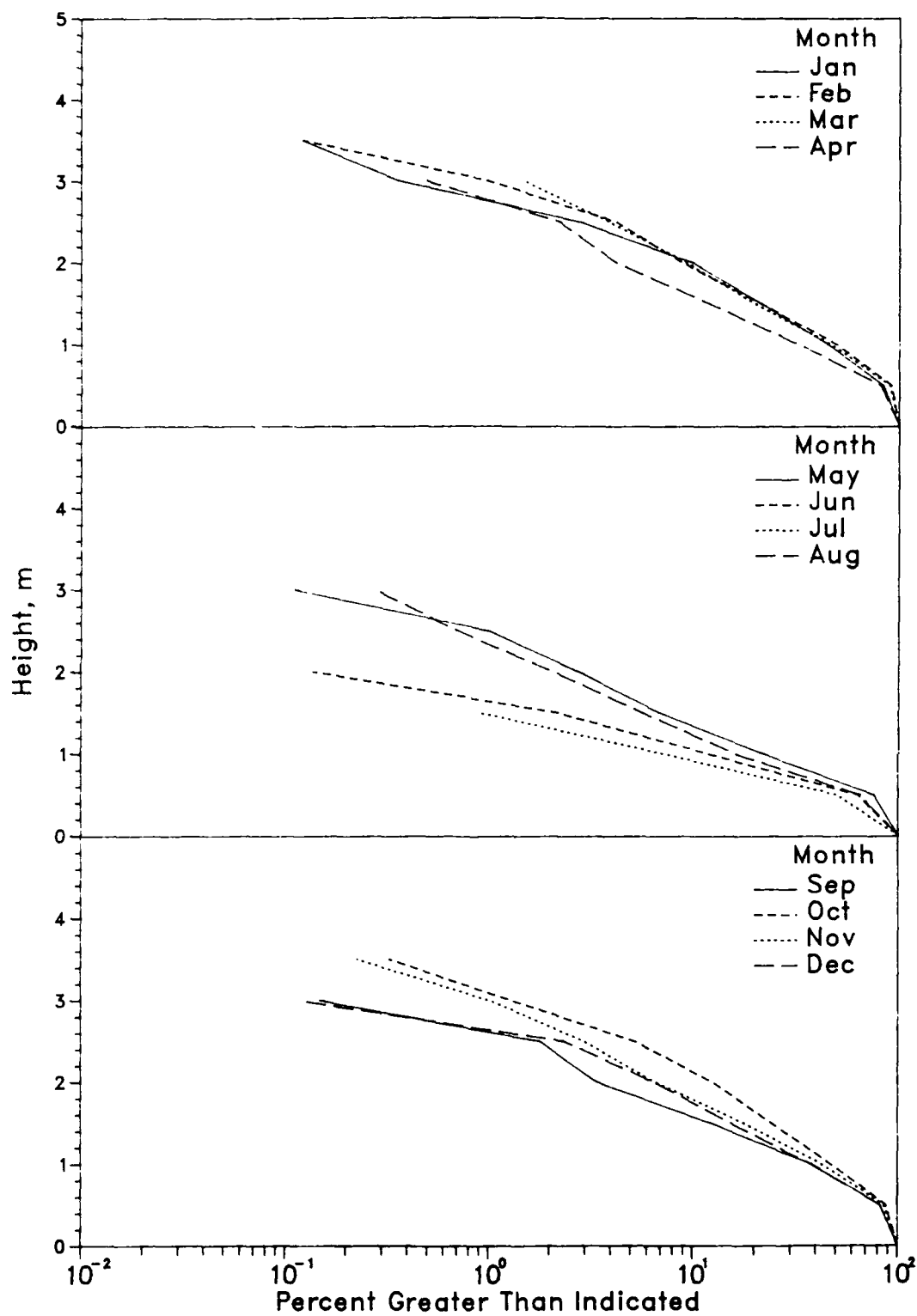


Figure D4. 1980-1987 monthly wave height distributions for Gage 625

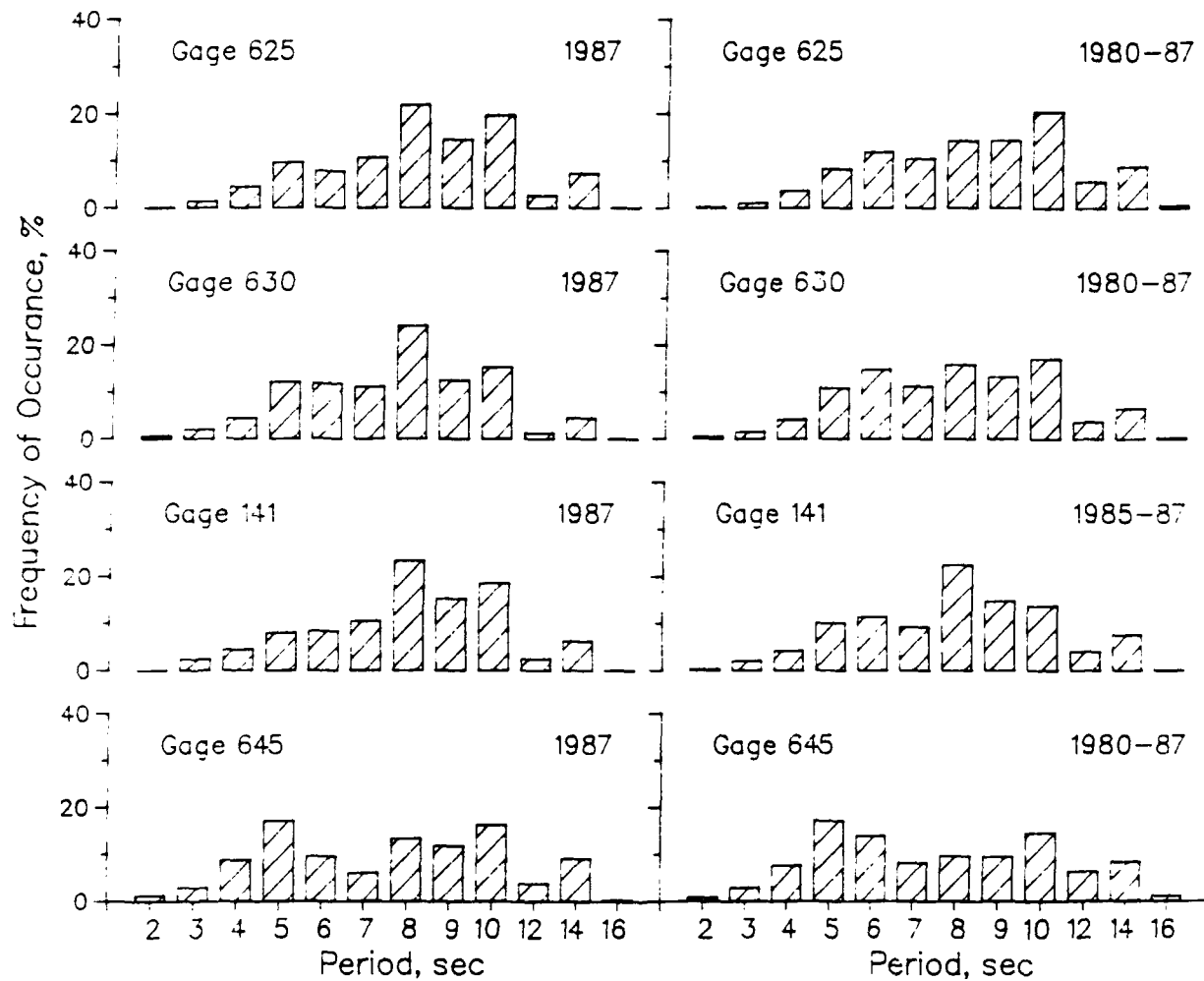


Figure D5. Annual wave period distributions for all gages

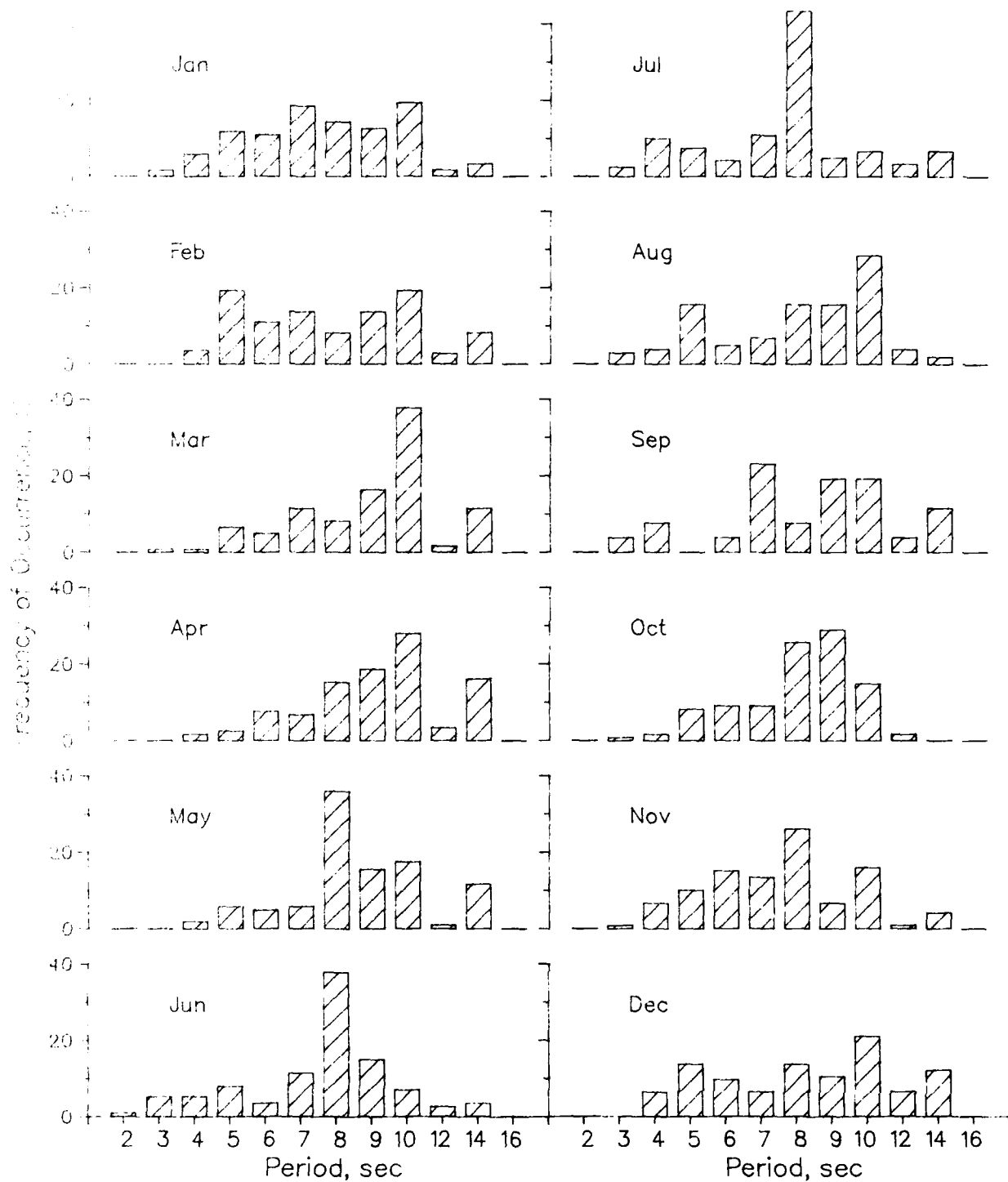


Figure D6. 1987 monthly wave period distributions for Gage 625

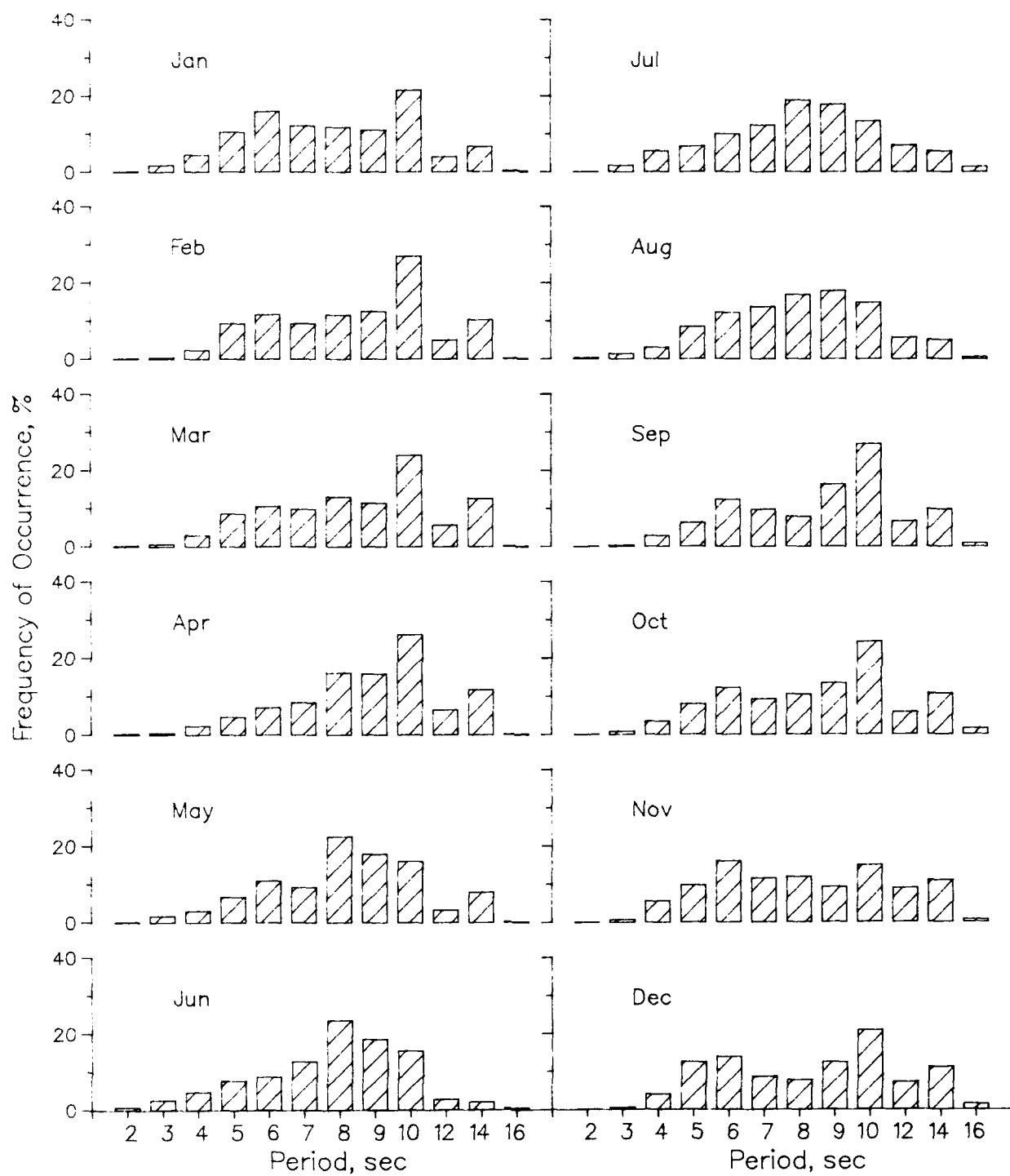


Figure D7. 1980-1987 monthly wave period distributions for Gage 625

Table D5
1987 Persistence of H_{mo} for Gage 625

Height (m)	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	31	30	23	22	18	16	11	10				9	8	7		6			
1.0	47	38	20	13	9	6		2		1									
1.5	30	19	12	6	4		1												
2.0	17	9	4	3			1												
2.5	9	4	2																
3.0	4	2																	

Table D6
1980 through 1987 Persistence of H_{mo} for Gage 625

Height (m)	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	28	25	21	19	16	14	12	11	10	9		8		7		6			4
1.0	46	33	22	15	10	7	6	4	3			1							
1.5	30	18	9	5	4	2	1												
2.0	16	8	4	2		1													
2.5	9	4	2	1															
3.0	3	1																	
3.5	1																		

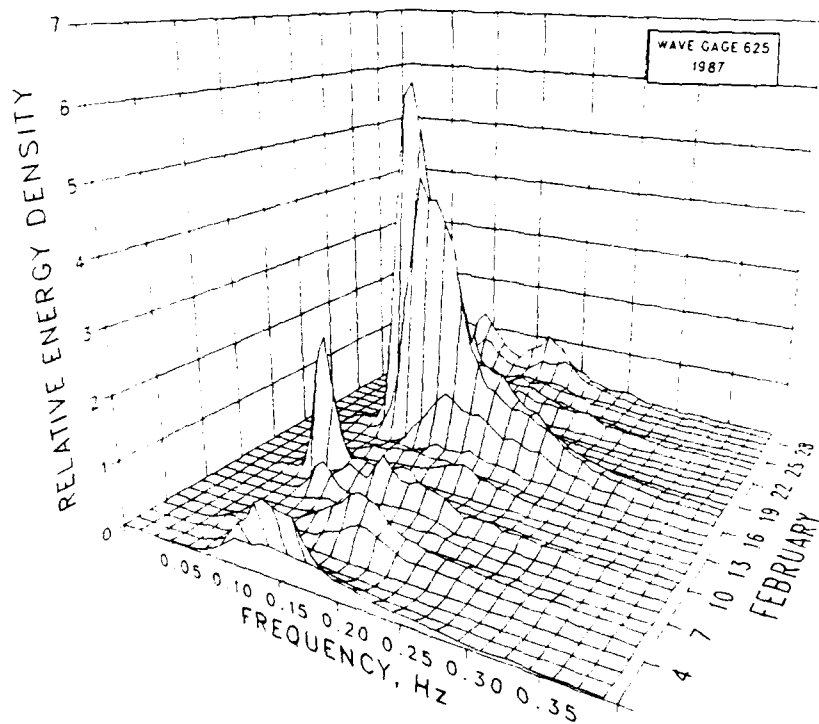
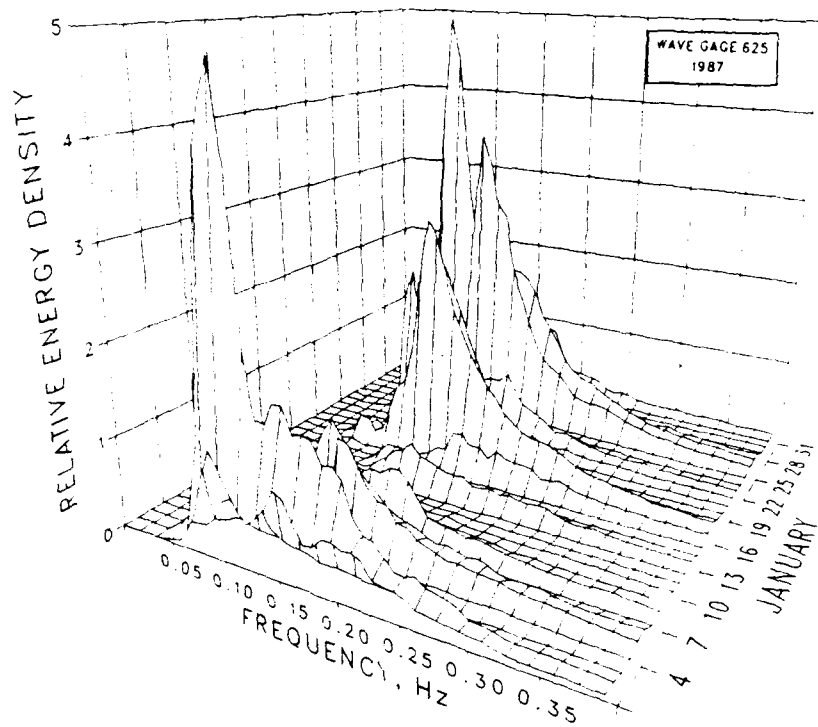


Figure D8. 1987 monthly spectra for Gage 625
(Sheet 1 of 6)

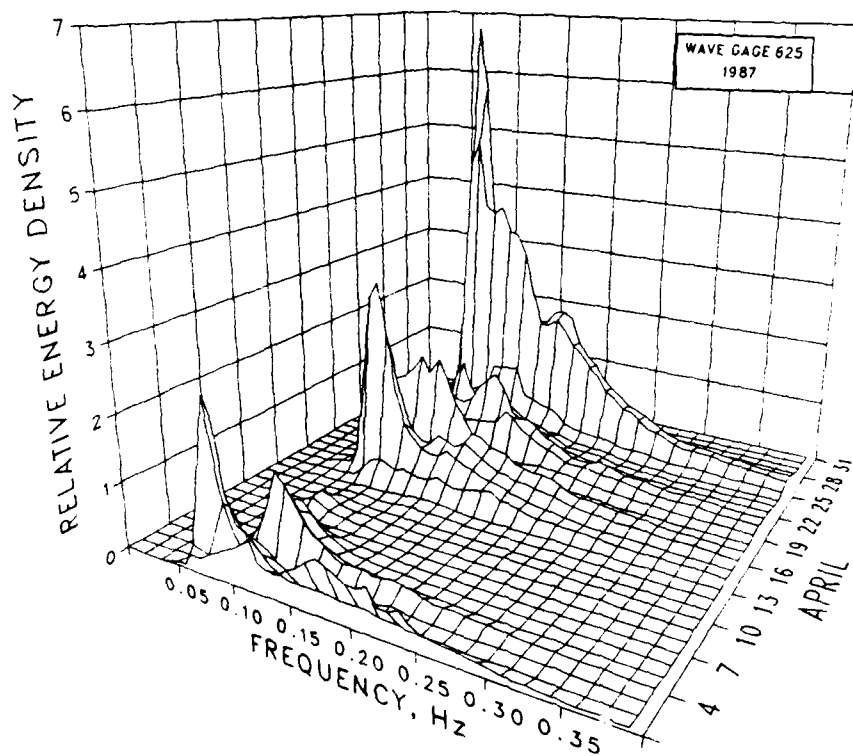
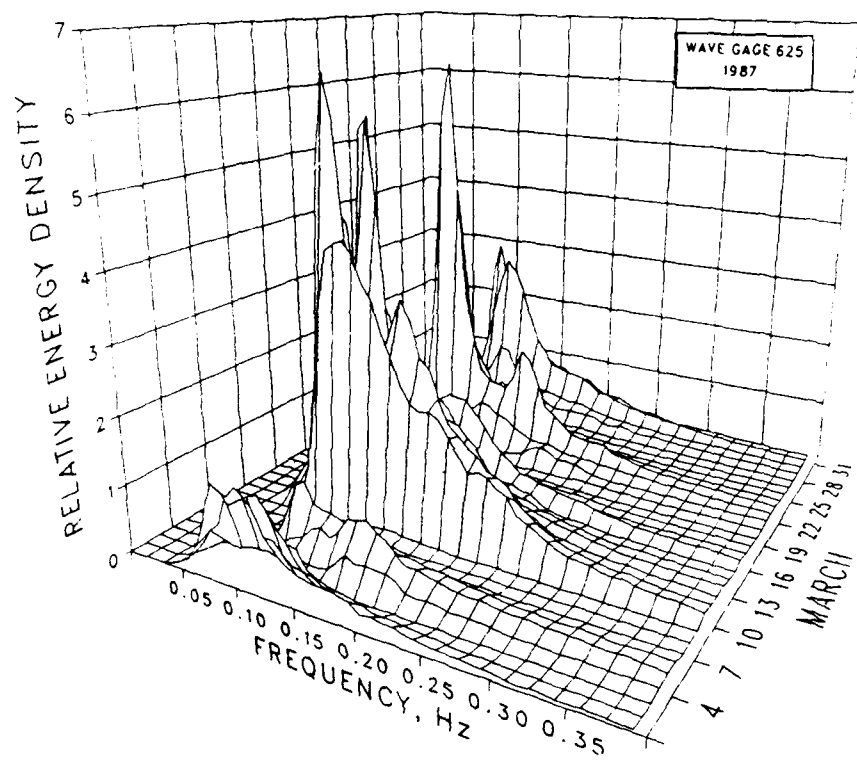


Figure D8. (Sheet 2 of 6)

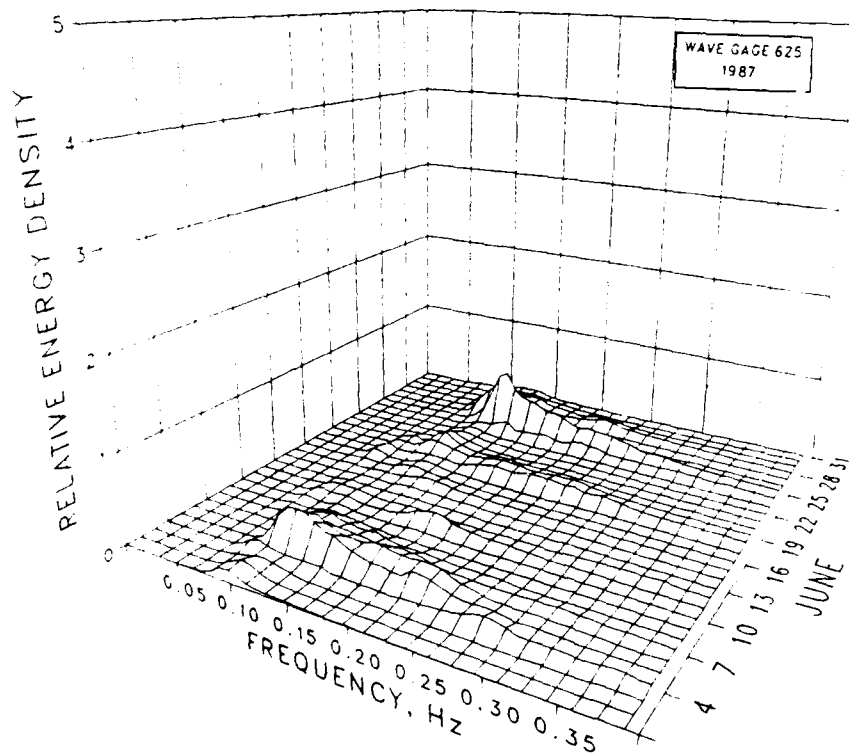
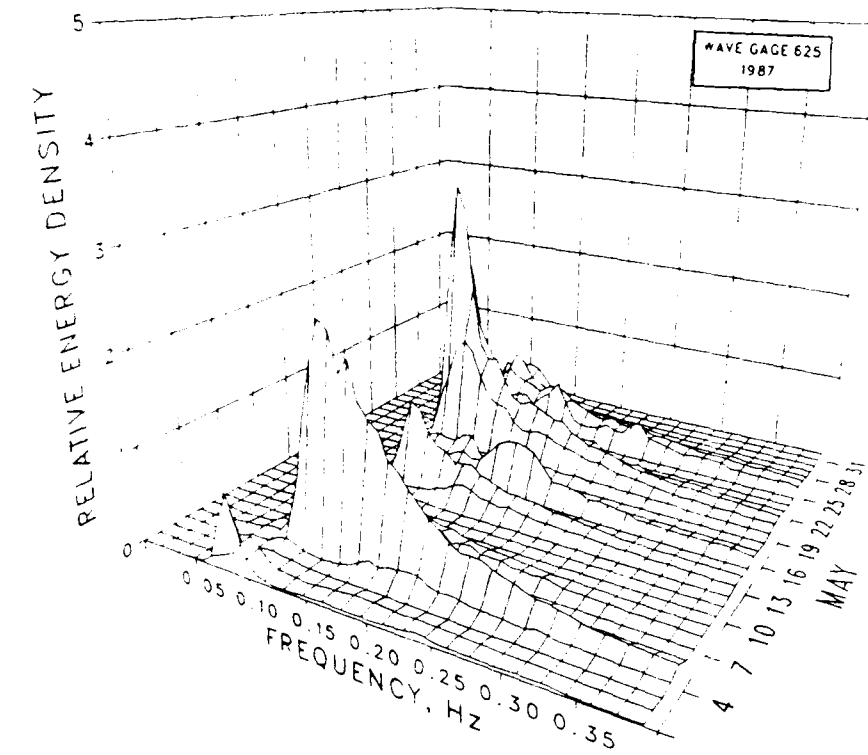


Figure D8. (Sheet 3 of 6)

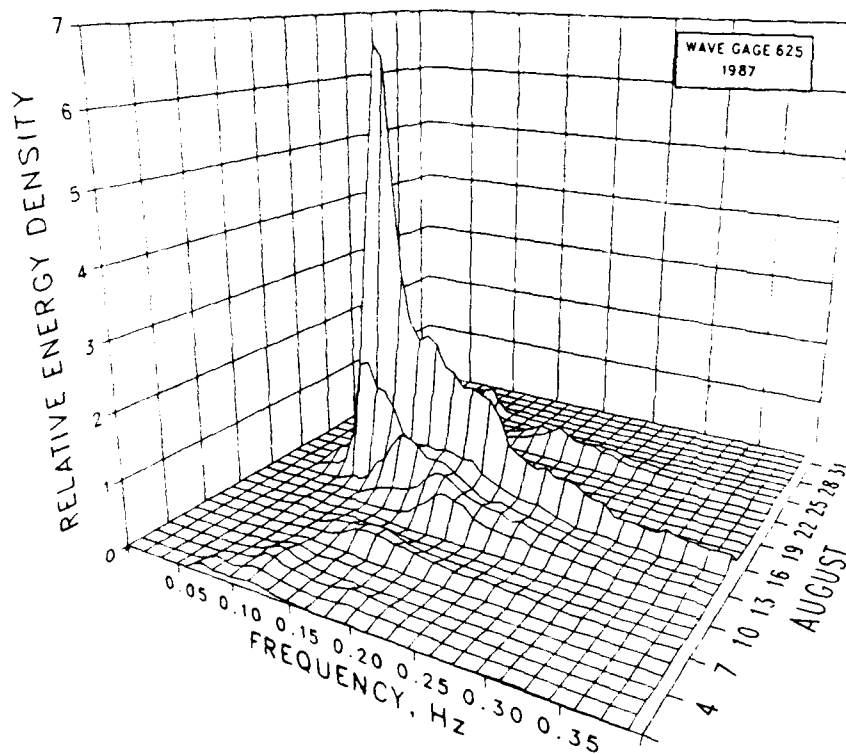
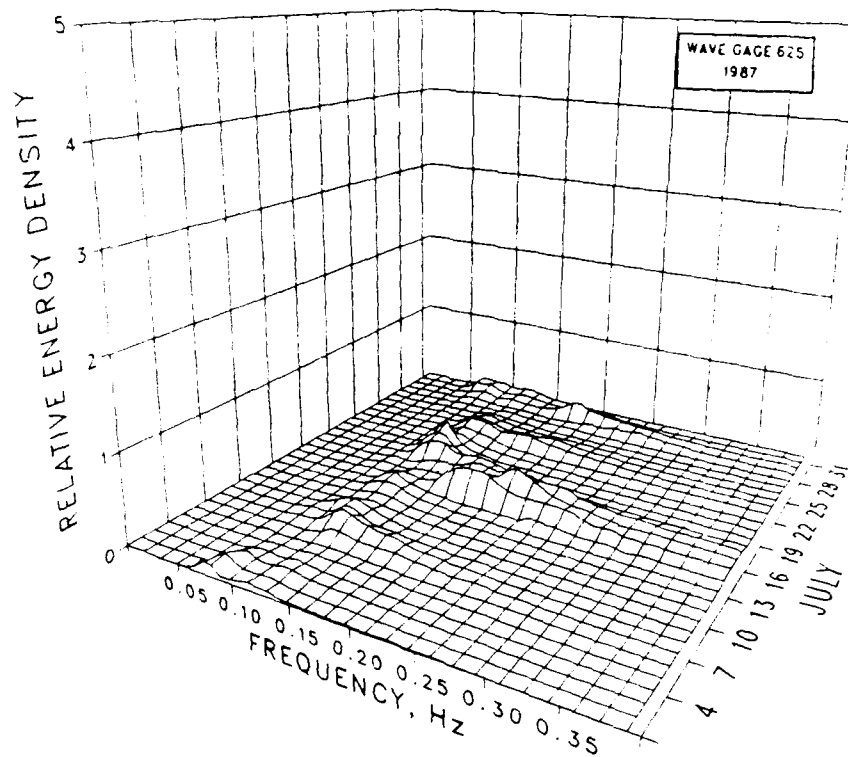


Figure D8. (Sheet 4 of 6)

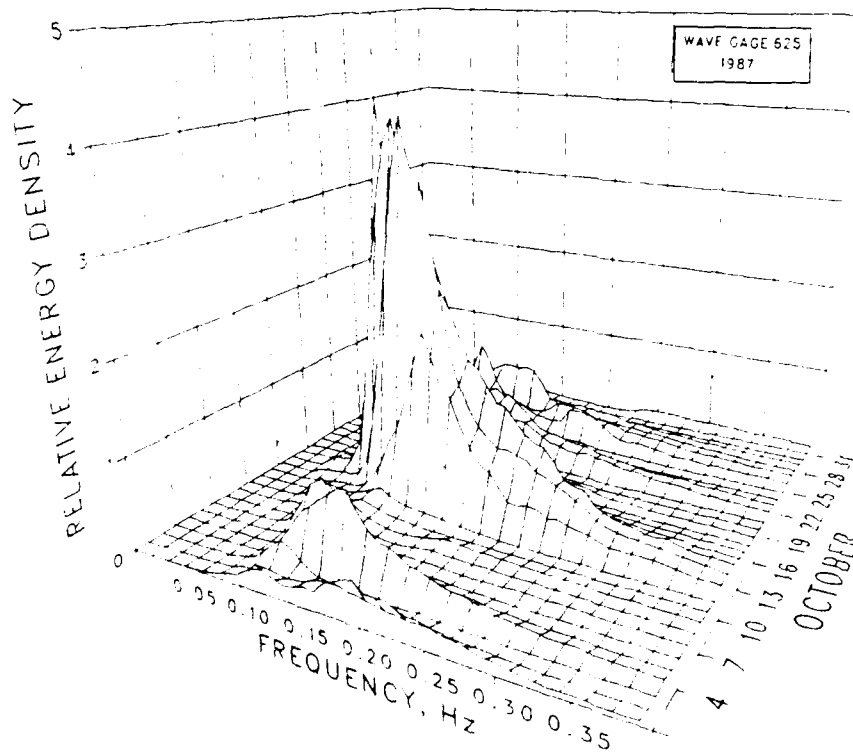
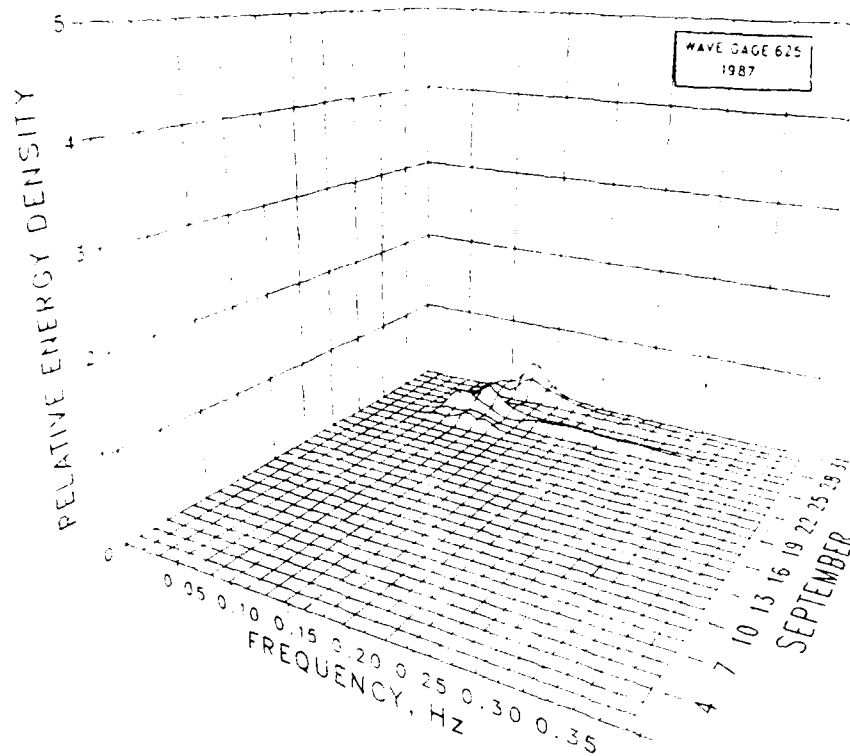


Figure D8. (Sheet 5 of 6)

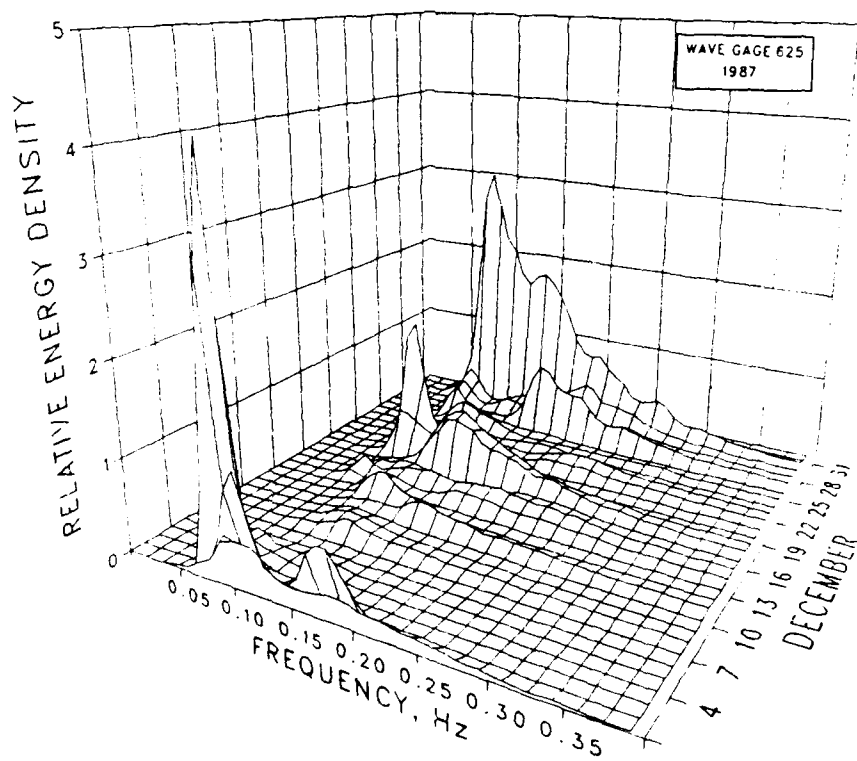
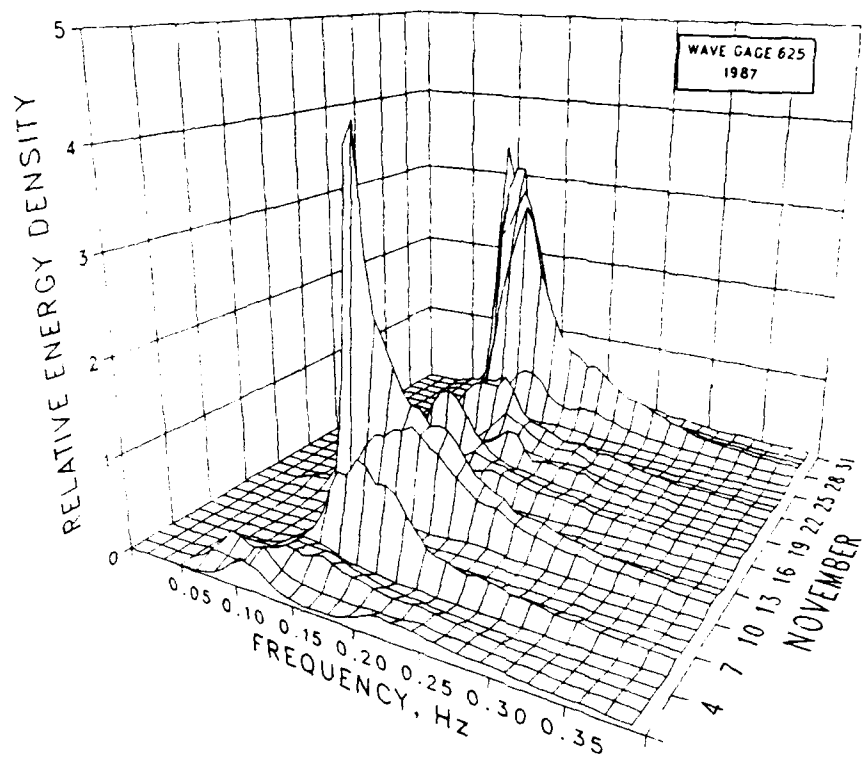


Figure D8. (Sheet 6 of 6)

Table D7
Wave Statistics for Gage 625

Month	1987								1980-1987							
	Height				Date	Period			Height				Date	Period		
	Mean	Std.	Extreme	Mean		Std.	Number	Mean	Std.	Extreme	Mean	Std.		Number		
		Dev.				Dev.			Dev.			Dev.				
	m	m	m		sec	sec	Obs.	m	m	m		sec	sec	Obs.		
Jan	1.1	0.7	3.5	1	8.3	2.4	119	1.1	0.7	3.5	1983	8.4	2.7	825		
Feb	1.1	0.6	3.3	17	8.5	2.6	109	1.1	0.6	3.8	1983	9.1	2.7	811		
Mar	1.4	0.8	3.4	10	9.7	2.3	122	1.1	0.7	3.3	1983	9.1	2.7	880		
Apr	1.2	0.7	3.1	26	9.9	2.2	118	0.9	0.6	3.0	1985	9.5	2.6	815		
May	0.9	0.5	2.3	4	9.3	2.2	103	0.8	0.5	3.0	1986	8.6	2.5	904		
Jun	0.6	0.3	1.4	24	8.1	2.4	114	0.7	0.4	2.0	1983	8.1	2.4	732		
Jul	0.6	0.2	1.1	15	8.3	2.5	120	0.6	0.3	1.8	1985	8.7	2.8	653		
Aug	0.8	0.4	2.4	14	8.7	2.6	102	0.7	0.5	3.1	1981	8.5	2.7	722		
Sep	0.6	0.2	0.8	25	9.1	2.7	26	0.9	0.5	3.0	1983	9.2	2.8	673		
Oct	1.0	0.6	2.8	14	8.6	1.8	121	1.2	0.7	3.5	1980	9.1	2.9	924		
Nov	1.0	0.6	2.3	29	8.1	2.2	119	1.1	0.6	3.5	1981	8.8	3.1	886		
Dec	0.9	0.5	2.7	30	9.1	2.9	124	1.0	0.6	3.1	1986	9.0	3.1	853		
Annual	1.0	0.6	3.5	Jan	8.8	2.5	1297	0.9	0.6	3.8	Feb 1983	8.8	2.8	9678		

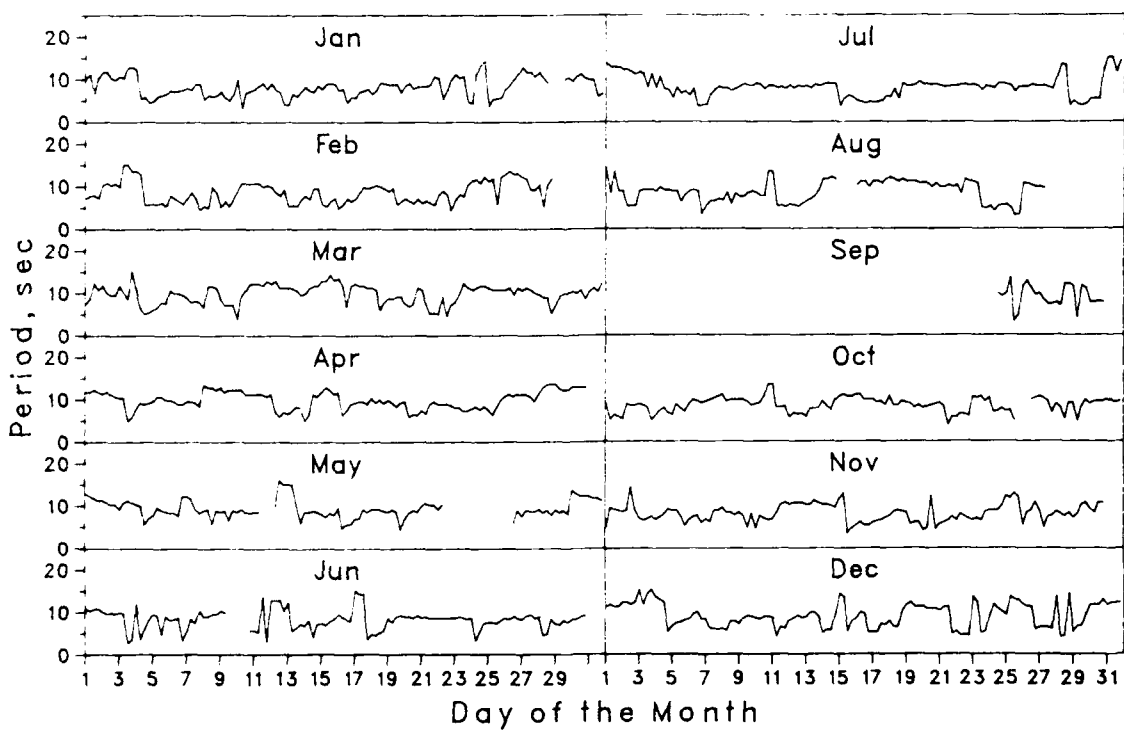
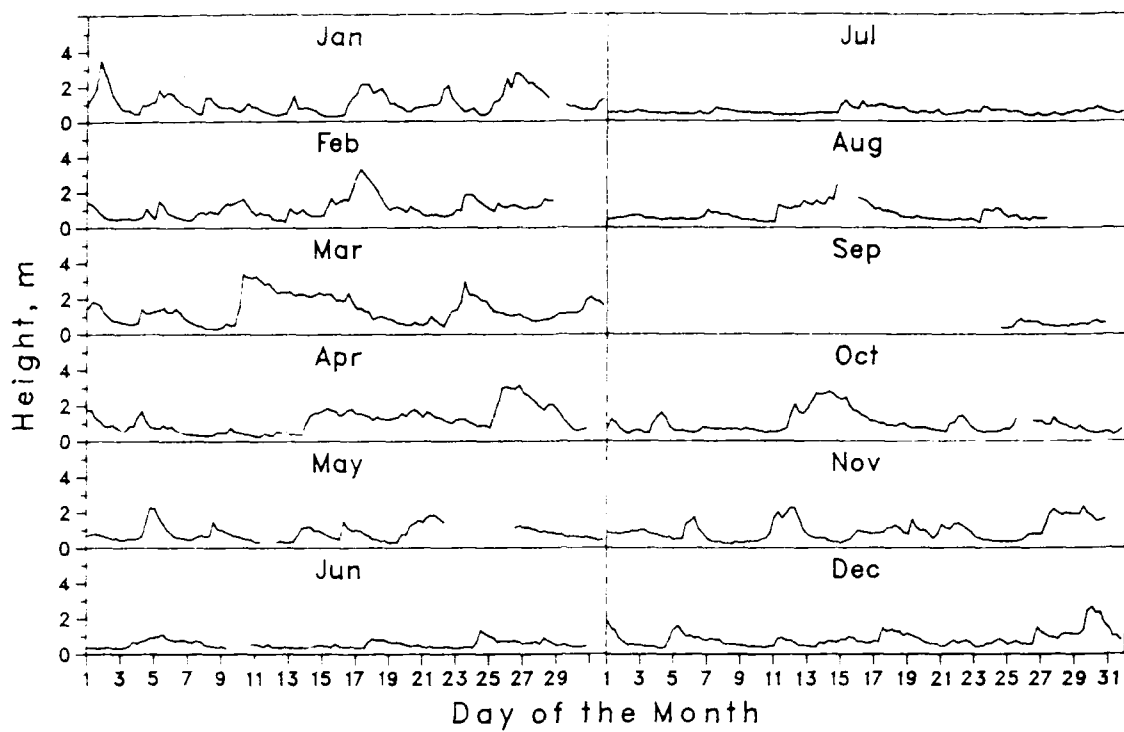


Figure D9. Time-histories of wave height and period for Gage 625

APPENDIX E: WAVE DATA FOR GAGE 645

1. Wave data summaries for Gage 645 are presented for 1987 and for 1980 through 1987 in the following forms:

Daily H_{mo} and T_p

2. Figure E1 displays the individual wave height and peak spectral wave period values along with the monthly mean values.

Joint Distributions of H_{mo} and T_p

3. Annual and monthly joint distributions tables are presented in Tables E1 and E2, and data for 1980 through 1987 are in Tables E3 and E4. Each table gives the frequency (in parts per 10,000) for which the wave height and peak period were within the specified intervals; these values can be converted to percent by dividing by 100. Marginal totals are also included. The row total gives the total number of observations out of 10,000 which fell within each specified peak period interval. The column total gives the number of observations out of 10,000 which fell within each specified wave height interval.

Cumulative Distributions of Wave Height

4. Annual and monthly wave height distributions for 1987 are plotted in cumulative form in Figures E2 and E3. Data for 1980 through 1987 are in Figure E4.

Peak Spectral Wave Period Distributions

5. Annual and monthly peak wave period, T_p , distribution histograms for 1987 are presented in Figures E5 and E6. Data for 1980 through 1987 are in Figure E7.

Persistence of Wave Heights

6. Table E5 shows the number of times in 1987 when the specified wave height was equaled or exceeded at least once during each day for the duration (consecutive days). Data for 1980 through 1987 are given in Table E6. An example is shown below:

Height m	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	18	15		14	13	12		11	10	9				8		7			
1.0	50	34	24	21	18	14	12	8	7	3				2					
1.5	41	19	8	6	2	1													
2.0	22	9	5	1															
2.5	10	5	2																
3.0	6	1																	
3.5		1																	
4.0	1																		

This example indicates that wave heights equaled or exceeded 1.0 m 50 times for at least 1 day; 34 times for at least 2 days; 24 times for at least 3 days, etc. Therefore, on 16 occasions the height equaled or exceeded 1.0 m for 1 day exactly ($50 - 34 = 16$); on 10 occasions for 2 days; on 3 occasions for 3 days, etc. Note that the height exceeded 1 m 50 times for 1 day or longer, while heights exceeded 0.5 m only 18 times for this same duration. This change in durations occurred because the longer durations of lower waves may be interspersed with shorter, but more frequent, intervals of higher waves. For example, one of the times that the wave heights exceeded 0.5 m for 16 days may have represented 3 times the height exceeded 1 m for shorter durations.

Spectra

7. Monthly spectra for the offshore Waverider buoy (Gage 645) are presented in Figure E8. The plots show "relative" energy density as a function of wave frequency. These figures summarize the large number of spectra for each month. The figures emphasize the higher energy density associated with storms as well as the general shifts in energy density to different frequencies. As used here, "relative" indicates the spectra have been smoothed by the 3-D surface drawing routine. Consequently, extremely high- and low-energy density values are modified to produce a smooth surface.

The figures are not intended for quantitative measurements; however, they do provide the energy density as a function of frequency relative to the other spectra for the month.

8. Monthly and annual wave statistics for Gage 645 for 1987 and for 1980 through 1987 are presented in Table E7.

9. Figure E9 plots monthly time histories of wave height and period.

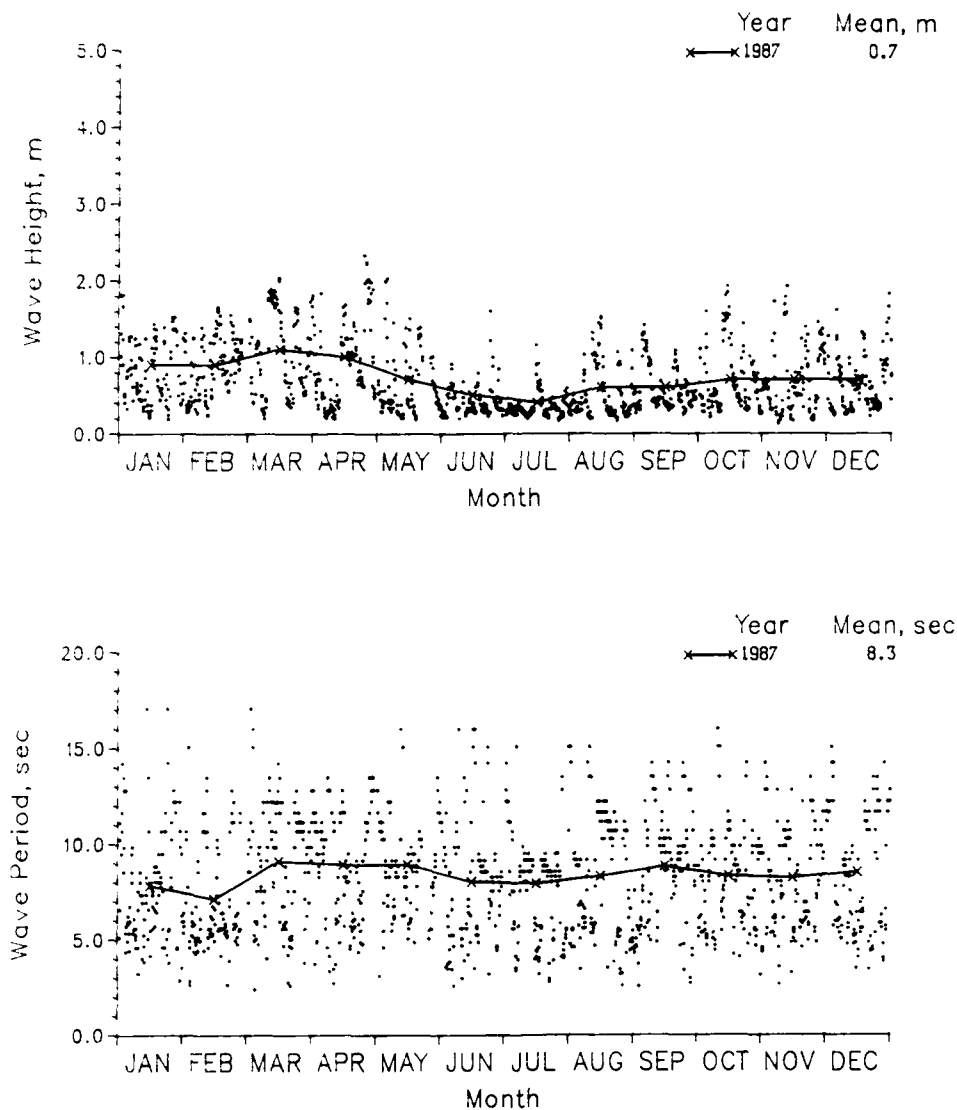


Figure E1. 1987 daily wave period values with monthly means for Gage 645

Table E1

Annual Joint Distribution of H_{mo} versus T_p

Annual 1987, Gage 645 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	71	127	311	396	234	255	828	793	800	269	587	14	4685
0.50 - 0.99	50	163	488	842	333	177	290	205	354	42	78	7	3029
1.00 - 1.49	.	.	78	460	347	113	156	85	241	7	127	.	1614
1.50 - 1.99	.	.	.	14	42	57	50	85	212	50	113	.	623
2.00 - 2.49	.	.	.	.	.	.	7	14	14	7	7	.	49
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	121	290	877	1712	956	602	1331	1182	1621	375	912	21	

Table E2
Monthly Joint Distribution of H_{mo} versus T_p

January 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	83	417	167	333	333	250	417	250	250	250	167	2917	
0.50 - 0.99	83	250	667	1000	167	250	917	167	333	.	.	.	3834	
1.00 - 1.49	.	.	.	833	750	333	250	83	250	.	250	.	2749	
1.50 - 1.99	250	83	167	.	500	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	83	333	1084	2000	1250	916	1417	667	1083	333	667	167		

February 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	183	.	367	275	183	92	92	92	459	92	367	.	2202	
0.50 - 0.99	92	92	734	1651	550	.	.	92	275	.	183	.	3669	
1.00 - 1.49	.	.	275	1651	826	183	.	.	734	.	.	.	3669	
1.50 - 1.99	.	.	.	.	.	92	92	183	92	.	.	.	459
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	275	92	1376	3577	1559	367	184	367	1560	92	550	0		

March 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49			164	328	328	328	164	82	246	.	246	.	1886	
0.50 - 0.99	246	82	164	574	82	82	246	410	902	.	.	82	2870	
1.00 - 1.49	.	.	246	492	410	164	82	328	410	.	246	.	2378	
1.50 - 1.99	.	.	.	.	.	82	164	492	902	246	820	.	2706
2.00 - 2.49	.	.	.	.	.	.	.	.	.	82	82	.	164
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	0	
Total	246	82	574	1394	820	656	656	1312	2460	328	1394	82		

(Continued)

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Table E2 (Continued)

April 1987, Gage 645 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0-	3.0-	4.0-	5.0-	6.0-	7.0-	8.0-	9.0-	10.0-	12.0-	14.0-	16.0-	
	2.9	3.9	4.9	5.9	6.9	7.9	8.9	9.9	11.9	13.9	15.9	or Larger	
0.00 - 0.49	85	169	169	254	85	85	85	424	932	169	424	.	2881
0.50 - 0.99	.	169	508	254	254	169	508	254	424	85	254	.	2879
1.00 - 1.49	.	.	169	678	339	.	508	85	339	85	424	.	2627
1.50 - 1.99	169	169	.	508	254	169	.	1269
2.00 - 2.49	169	169	.	.	.	338
2.50 - 2.99	0
3.00 - 3.49	0
3.50 - 3.99	0
4.00 - 4.49	0
4.50 - 4.99	0
5.00 - Greater	0
Total	85	338	846	1186	678	423	1270	932	2372	593	1271	0	

May 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 ~ 0.49	.	97	.	.	97	291	1359	874	1359	97	777	.	4951	
0.50 ~ 0.99	.	.	194	485	777	583	485	97	388	.	97	.	3106	
1.00 ~ 1.49	.	.	.	291	97	97	388	194	388	.	.	.	1455	
1.50 ~ 1.99	.	.	.	194	97	.	.	97	.	.	.	.	388
2.00 ~ 2.49	97	.	.	.	.	.	97	
2.50 ~ 2.99	0	
3.00 ~ 3.49	0	
3.50 ~ 3.99	0	
4.00 ~ 4.49	0	
4.50 ~ 4.99	0	
5.00 ~ Greater	0	
Total	0	97	194	970	1068	971	2329	1262	2135	97	874	0		

June 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	88	175	439	614	526	439	1930	1404	789	351	702	.	7457	
0.50 - 0.99	88	526	351	789	351	88	175	.	.	.	.	.	2368
1.00 - 1.49	.	.	.	.	.	88	.	.	.	.	.	.	88
1.50 - 1.99	.	.	.	.	88	.	.	.	.	.	.	.	88
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	176	701	790	1403	965	615	2105	1404	789	351	702	0		

(Continued)

(Sheet 2 of 4)

Table E2 (Continued)

July 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	165	413	579	1074	83	496	2893	1322	579	165	909	.	8678	
0.50 - 0.99	.	248	579	331	83	.	.	.	.	.	.	.	1241
1.00 - 1.49	.	.	.	83	.	.	.	.	.	.	.	.	83
1.50 - 1.99	0	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	165	661	1158	1488	166	496	2893	1322	579	165	909	0		

August 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	81	403	403	484	484	242	403	968	2177	403	403	.	6451	
0.50 - 0.99	.	81	484	806	403	81	.	81	323	.	.	.	2259	
1.00 - 1.49	.	.	161	484	81	.	81	.	81	.	242	.	1130	
1.50 - 1.99	161	.	.	.	161	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	81	484	1048	1774	968	323	484	1049	2742	403	645	0		

September 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	167	.	417	417	167	167	667	1167	583	833	1000	.	5585	
0.50 - 0.99	83	167	500	333	83	417	500	417	750	.	.	.	3250	
1.00 - 1.49	.	.	.	333	167	167	250	.	167	.	83	.	1167	
1.50 - 1.99	.	.	.	.	.	.	.	.	.	.	.	.	0
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	0	
Total	250	167	917	1083	417	751	1417	1584	1500	833	1083	0		

(Continued)

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Table E2 (Concluded)

October 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	165	248	248	83	1074	1240	413	331	413	.	4215	
0.50 - 0.99	.	83	413	1157	331	165	413	744	331	.	.	.	3637	
1.00 - 1.49	.	.	83	331	496	83	.	.	331	.	.	.	1324	
1.50 - 1.99	83	248	165	83	248	.	.	.	827	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	83	661	1736	1158	579	1652	2067	1323	331	413	0		

November 1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	85	171	256	513	256	342	684	598	769	85	598	.	4357	
0.50 - 0.99	.	.	598	855	342	256	256	171	256	342	171	.	3247	
1.00 - 1.49	.	.	.	256	513	171	342	256	171	.	.	.	1709	
1.50 - 1.99	171	85	.	171	256	.	.	.	683	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	85	171	854	1624	1282	854	1282	1196	1452	427	769	0		

December 1987, Gage 645														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	.	.	323	323	.	161	403	887	1048	403	968	.	4516	
0.50 - 0.99	.	242	645	1855	645	81	.	.	242	81	242	.	4033	
1.00 - 1.49	.	.	.	161	484	81	.	81	81	.	242	.	1130	
1.50 - 1.99	81	.	.	.	81	.	161	.	323	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	0	242	968	2339	1210	323	403	968	1452	484	1613	0		

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Table E3
Annual Joint Distribution of H_{mo} versus T_p (All Years)

Annual 1980-1987, Gage 645 Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	49	105	225	413	277	270	492	506	636	346	347	62	3728
0.50 - 0.99	28	181	483	980	710	357	350	310	555	148	263	34	4399
1.00 - 1.49	.	1	54	314	370	162	105	90	191	98	163	9	1557
1.50 - 1.99	.	.	.	9	34	28	18	36	70	36	60	5	296
2.00 - 2.49	.	.	.	.	.	2	1	2	3	7	6	.	21
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	77	287	762	1716	1391	819	966	944	1455	635	839	110	

Table E4
Monthly Joint Distribution of H_{mo} versus T_p (All Years)

January 1980-1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	88	113	290	391	252	177	315	441	416	240	265	63	3051	
0.50 - 0.99	25	177	441	1072	807	277	265	214	631	63	252	25	4249	
1.00 - 1.49	.	.	63	555	706	315	214	88	240	25	227	.	2433	
1.50 - 1.99	.	.	.	13	13	25	13	25	113	13	38	.	253	
2.00 - 2.49	.	.	.	.	.	.	.	.	.	13	.	.	13
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	113	290	794	2031	1778	794	807	768	1400	354	782	88		

February 1980-1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	38	64	216	394	102	140	191	102	712	152	165	13	2289	
0.50 - 0.99	64	178	343	1067	648	241	280	305	864	203	356	.	4549	
1.00 - 1.49	.	.	64	648	635	216	102	114	381	267	203	.	2630	
1.50 - 1.99	.	.	.	.	51	89	38	51	38	76	178	.	521
2.00 - 2.49	.	.	.	.	.	.	.	.	.	13	.	.	13
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	102	242	623	2109	1436	686	611	572	1995	711	902	13		

March 1980-1987, Gage 645 Percent Occurrence(X100) of Height and Period														Total
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	125	114	216	296	171	114	250	216	353	159	296	.	2310	
0.50 - 0.99	57	273	410	1024	671	341	273	398	728	239	466	11	4891	
1.00 - 1.49	.	11	125	364	398	182	137	125	273	182	319	.	2116	
1.50 - 1.99	.	.	.	11	.	23	34	102	193	137	137	.	637	
2.00 - 2.49	.	.	.	.	.	.	.	.	.	23	23	.	46
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	0	
Total	182	398	751	1695	1240	660	694	841	1547	740	1241	11		

(Continued)

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Table E4 (Continued)

April 1980-1987, Gage 645													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	62	164	214	290	214	290	529	428	567	542	441	38	3780
0.50 - 0.99	25	227	441	819	567	315	428	315	831	113	390	13	4484
1.00 - 1.49	.	.	38	214	290	88	139	139	227	101	227	.	1463
1.50 - 1.99	.	.	.	.	.	25	38	.	88	38	38	.	227
2.00 - 2.49	.	.	.	.	.	.	.	25	25	.	.	.	50
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	88	391	693	1323	1071	718	1134	907	1738	794	1096	51	

May 1980-1987, Gage 645													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	23	141	211	504	340	375	597	562	714	222	422	35	4146
0.50 - 0.99	12	164	550	1124	937	445	445	328	480	105	199	23	4812
1.00 - 1.49	.	.	23	164	141	47	94	82	117	70	152	.	890
1.50 - 1.99	.	.	.	23	35	.	.	12	23	23	23	.	139
2.00 - 2.49	.	.	.	.	.	.	12	.	.	.	.	.	12
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	35	305	784	1815	1453	867	1148	984	1334	420	796	58	

June 1980-1987, Gage 645													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	49	182	388	874	558	534	850	825	631	437	206	109	5643
0.50 - 0.99	36	194	534	1007	485	340	473	364	376	49	24	36	3918
1.00 - 1.49	.	.	12	97	97	35	36	12	109	.	24	.	423
1.50 - 1.99	.	.	.	.	12	.	.	.	.	.	.	.	12
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	0
Total	85	376	934	1978	1152	910	1359	1201	1116	486	254	145	

(Continued)

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Table E4 (Continued)

July 1980-1987, Gage 645														
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													Total
	2.0-	3.0-	4.0-	5.0-	6.0-	7.0-	8.0-	9.0-	10.0-	12.0-	14.0-	16.0-		
	2.9	3.9	4.9	5.9	6.9	7.9	8.9	9.9	11.9	13.9	15.9	Longer		
0.00 - 0.49	60	131	418	704	537	549	1384	1062	835	406	394	95	6575	
0.50 - 0.99	.	143	477	680	549	298	370	239	143	119	36	72	3126	
1.00 - 1.49	.	.	12	155	48	24	36	.	24	.	.	.	299	
1.50 - 1.99	0	
2.00 - 2.49	0	
2.50 - 2.99	0	
3.00 - 3.49	0	
3.50 - 3.99	0	
4.00 - 4.49	0	
4.50 - 4.99	0	
5.00 - Greater	0	
Total	60	274	907	1539	1134	871	1790	1301	1002	525	430	167		

August 1980-1987, Gage 645														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	12	173	196	577	497	404	739	878	878	404	335	23	5116	
0.50 - 0.99	12	242	600	1062	635	439	381	242	312	35	115	.	4075	
1.00 - 1.49	.	.	35	173	162	92	23	23	58	46	81	.	693	
1.50 - 1.99	.	.	.	.	23	35	12	.	35	12	.	.	117
2.00 - 2.49	.	.	.	.	.	.	.	.	.	.	.	.	0
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	24	415	831	1812	1317	970	1155	1143	1283	497	531	23		

September 1980-1987, Gage 645														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	48	24	109	230	158	206	339	473	776	412	473	85	3333	
0.50 - 0.99	61	133	485	727	679	545	436	509	618	267	448	24	4932	
1.00 - 1.49	.	.	61	339	364	182	145	121	182	36	133	24	1587	
1.50 - 1.99	.	.	.	12	36	12	.	12	.	.	36	.	108	
2.00 - 2.49	.	.	.	.	.	.	.	.	.	12	24	.	36
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	109	157	655	1308	1237	945	920	1115	1576	727	1114	133		

(Continued)

(Sheet 3 of 4)

Table E4 (Concluded)

October 1980-1987, Gage 645													
Percent Occurrence(X100) of Height and Period													
Height(m)	Period(sec)												Total
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer	
0.00 - 0.49	34	34	68	192	214	169	316	316	519	225	361	79	2527
0.50 - 0.99	11	79	428	846	676	271	361	327	846	203	248	45	4341
1.00 - 1.49	.	.	34	417	474	327	147	169	395	203	214	34	2414
1.50 - 1.99	.	.	.	11	101	68	34	79	180	68	68	56	665
2.00 - 2.49	.	.	.	.	.	11	.	.	.	23	23	.	57
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	45	113	530	1466	1465	846	858	891	1940	722	914	214	

November 1980-1987, Gage 645														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	34	34	207	264	138	149	230	264	436	402	344	46	2548	
0.50 - 0.99	23	149	540	1022	884	517	287	241	482	276	287	69	4777	
1.00 - 1.49	.	.	69	310	631	264	138	69	149	218	207	46	2101	
1.50 - 1.99	.	.	.	23	92	57	11	115	115	46	103	.	562	
2.00 - 2.49	.	.	.	.	.	.	.	.	11	.	.	.	11
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	57	183	816	1619	1745	987	666	689	1193	942	941	161		

December 1980-1987, Gage 645														Total
Percent Occurrence(X100) of Height and Period														
Height(m)	Period(sec)													
	2.0- 2.9	3.0- 3.9	4.0- 4.9	5.0- 5.9	6.0- 6.9	7.0- 7.9	8.0- 8.9	9.0- 9.9	10.0- 11.9	12.0- 13.9	14.0- 15.9	16.0- Longer		
0.00 - 0.49	12	92	185	254	139	139	173	497	798	555	451	162	3457	
0.50 - 0.99	12	220	532	1295	960	243	208	243	382	92	335	81	4603	
1.00 - 1.49	.	.	104	358	509	162	58	139	150	23	162	.	1665	
1.50 - 1.99	.	.	.	12	35	.	35	23	46	12	104	.	267	
2.00 - 2.49	.	.	.	.	.	12	.	.	.	.	.	.	12
2.50 - 2.99	.	.	.	.	.	.	.	.	.	.	.	.	0
3.00 - 3.49	.	.	.	.	.	.	.	.	.	.	.	.	0
3.50 - 3.99	.	.	.	.	.	.	.	.	.	.	.	.	0
4.00 - 4.49	.	.	.	.	.	.	.	.	.	.	.	.	0
4.50 - 4.99	.	.	.	.	.	.	.	.	.	.	.	.	0
5.00 - Greater	.	.	.	.	.	.	.	.	.	.	.	.	0
Total	24	312	821	1919	1643	556	474	902	1376	682	1052	243		

(Sheet 4 of 4)

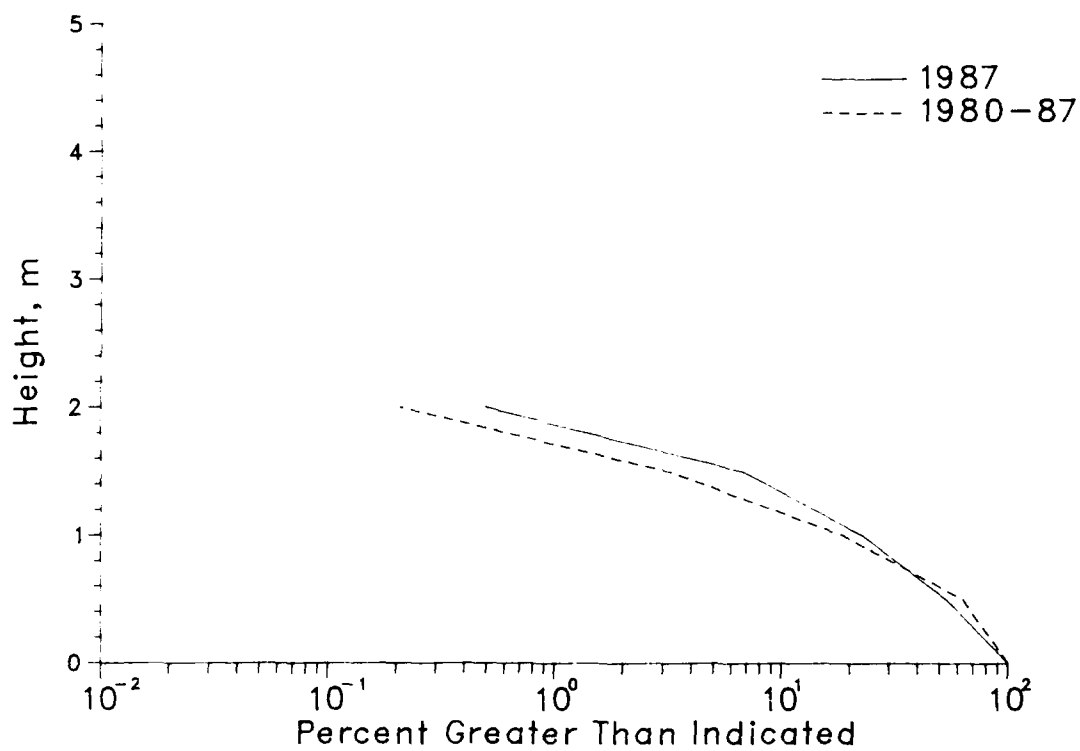


Figure E2. Annual cumulative wave height distributions
for Gage 645

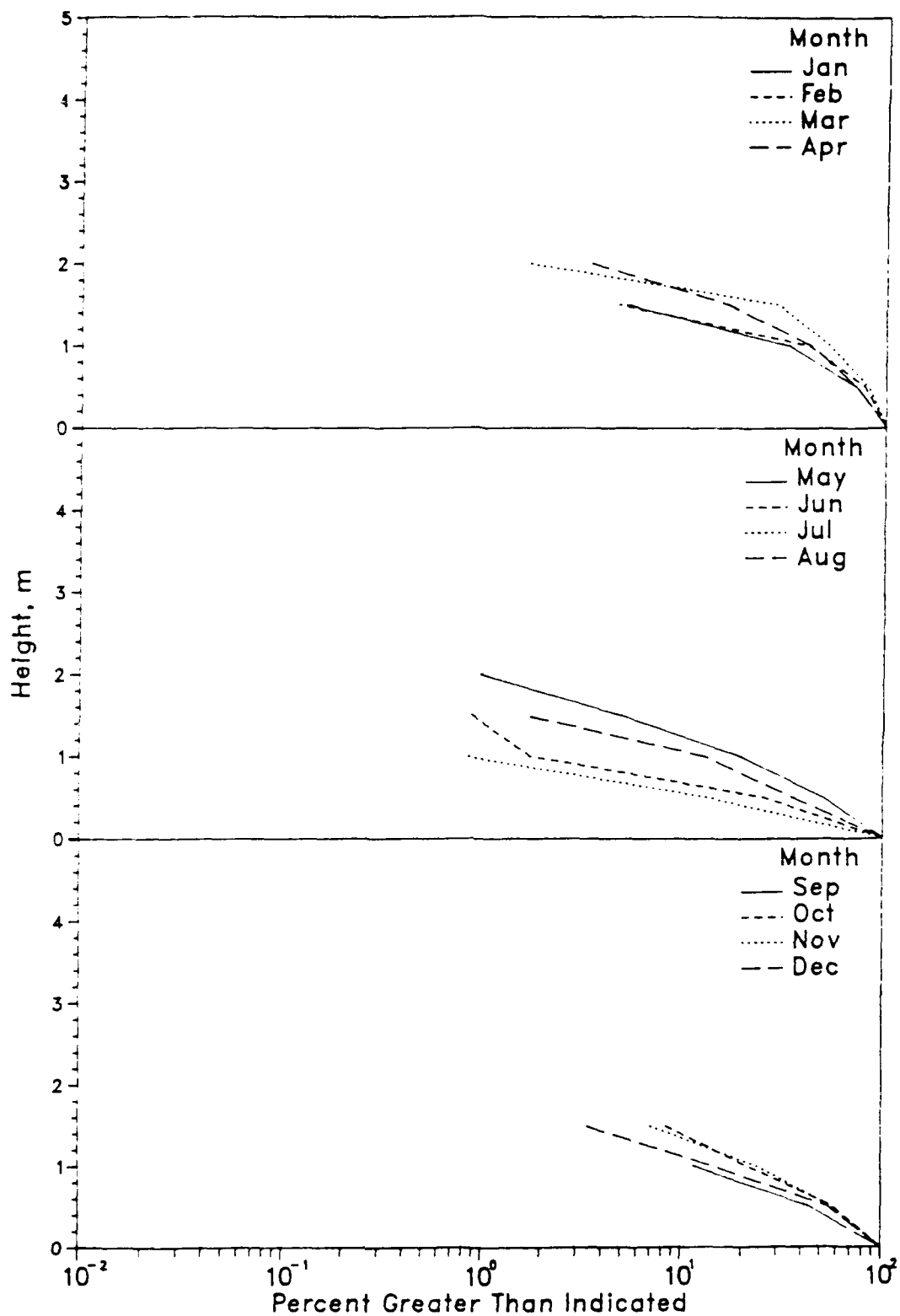


Figure E3. 1987 monthly wave height distributions
for Gage 645

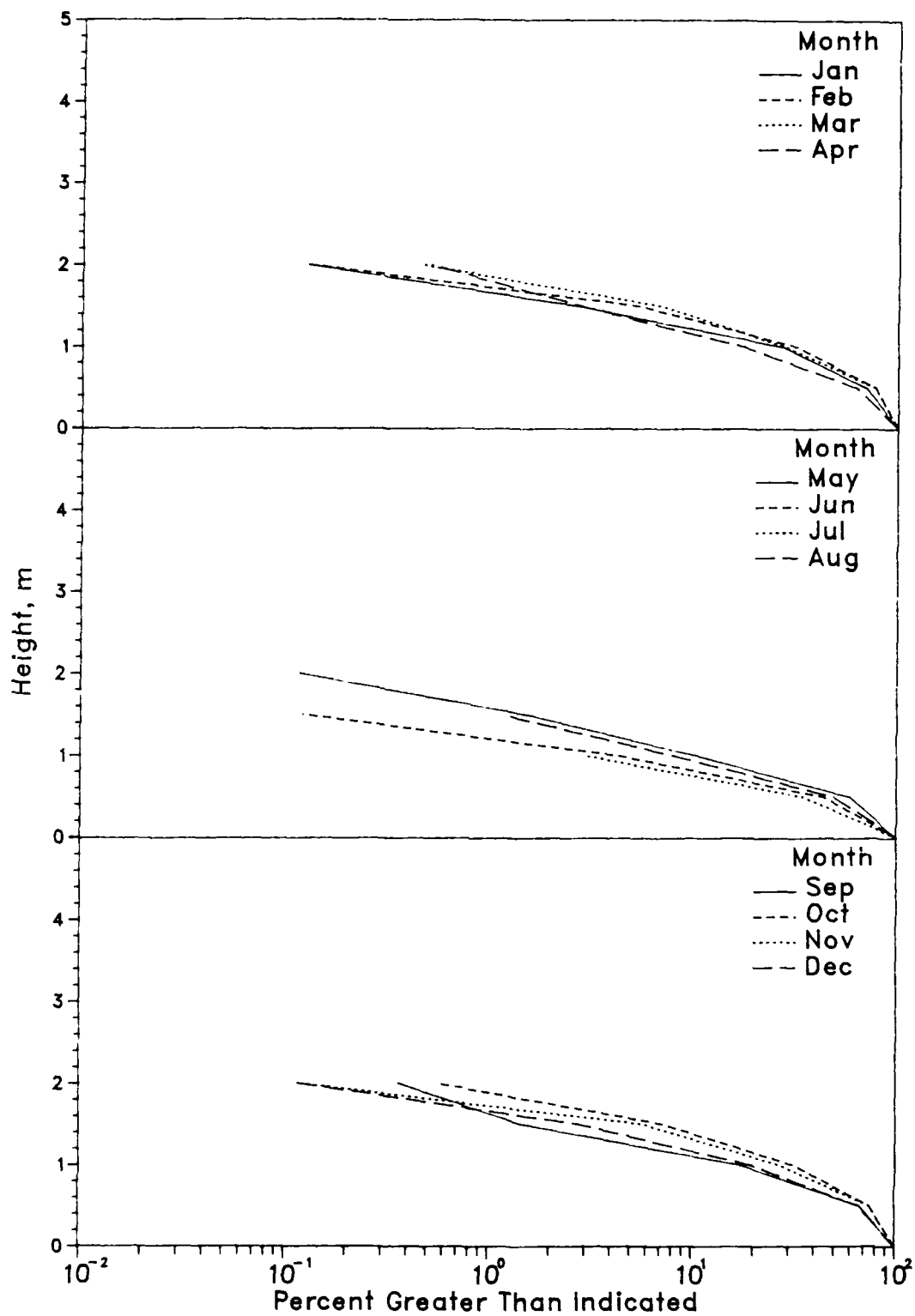


Figure E4. 1980-1987 monthly wave height distributions for Gage 645

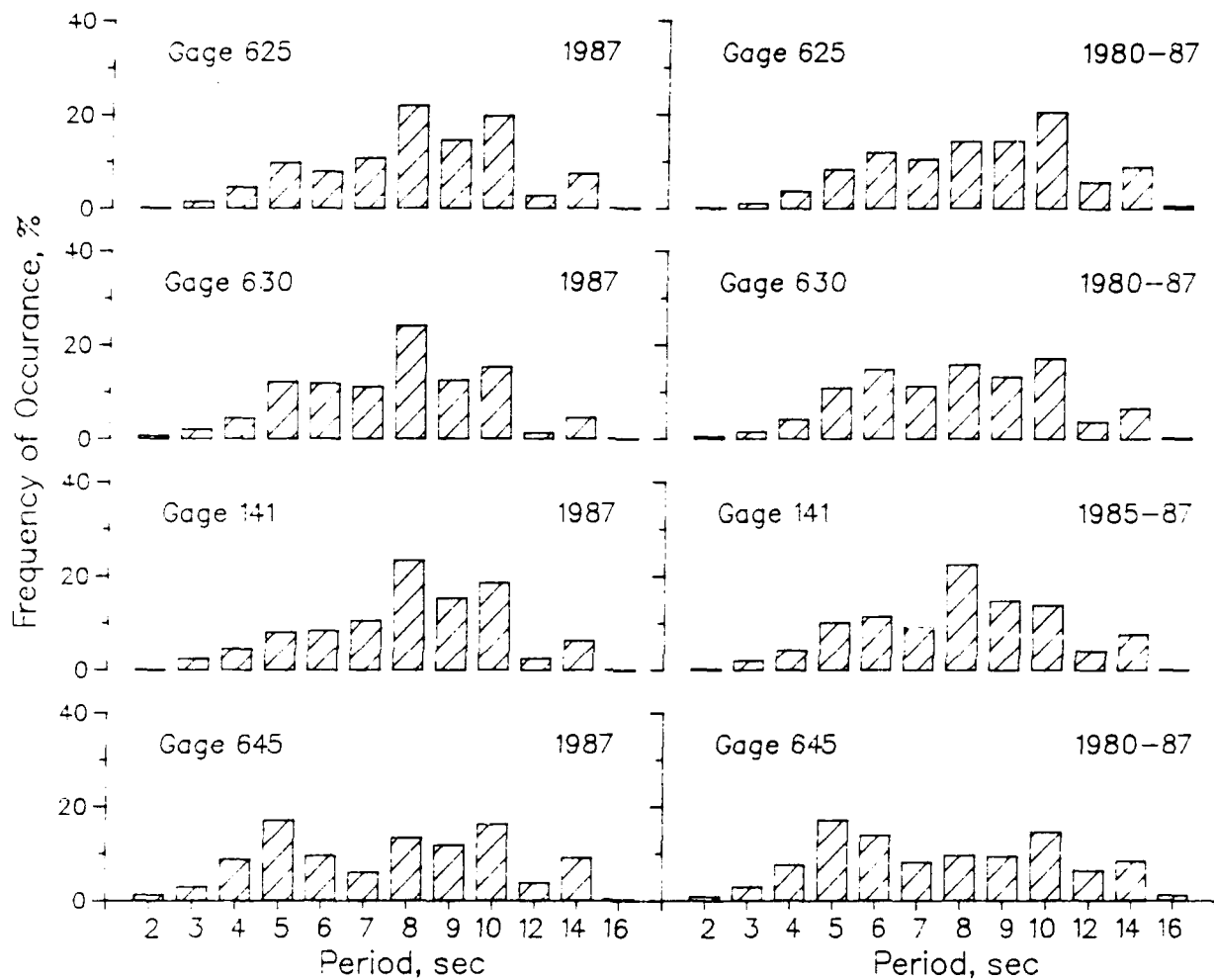


Figure E5. Annual wave period distributions for all gages

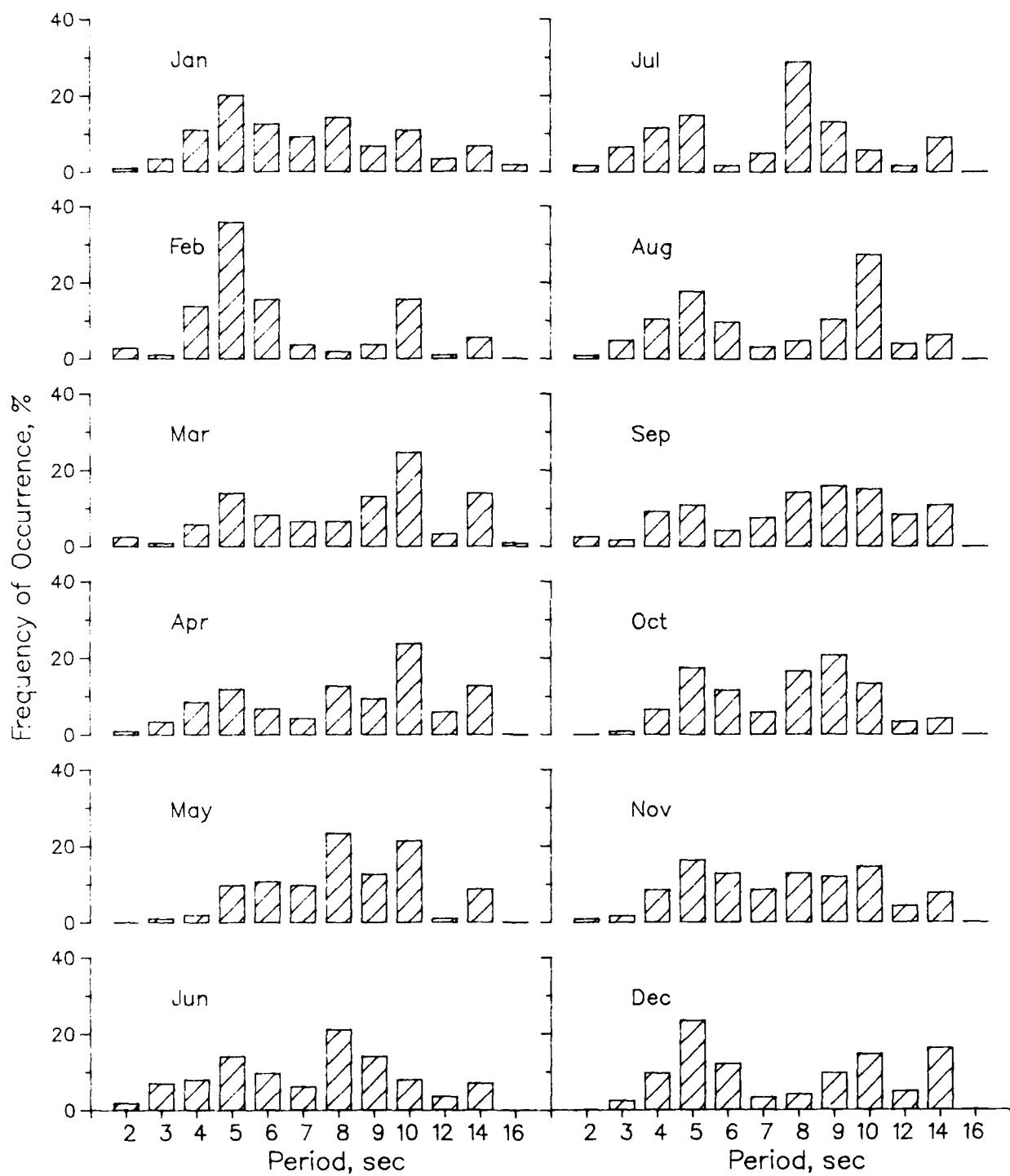


Figure E6. 1987 monthly wave period distributions for Gage 645

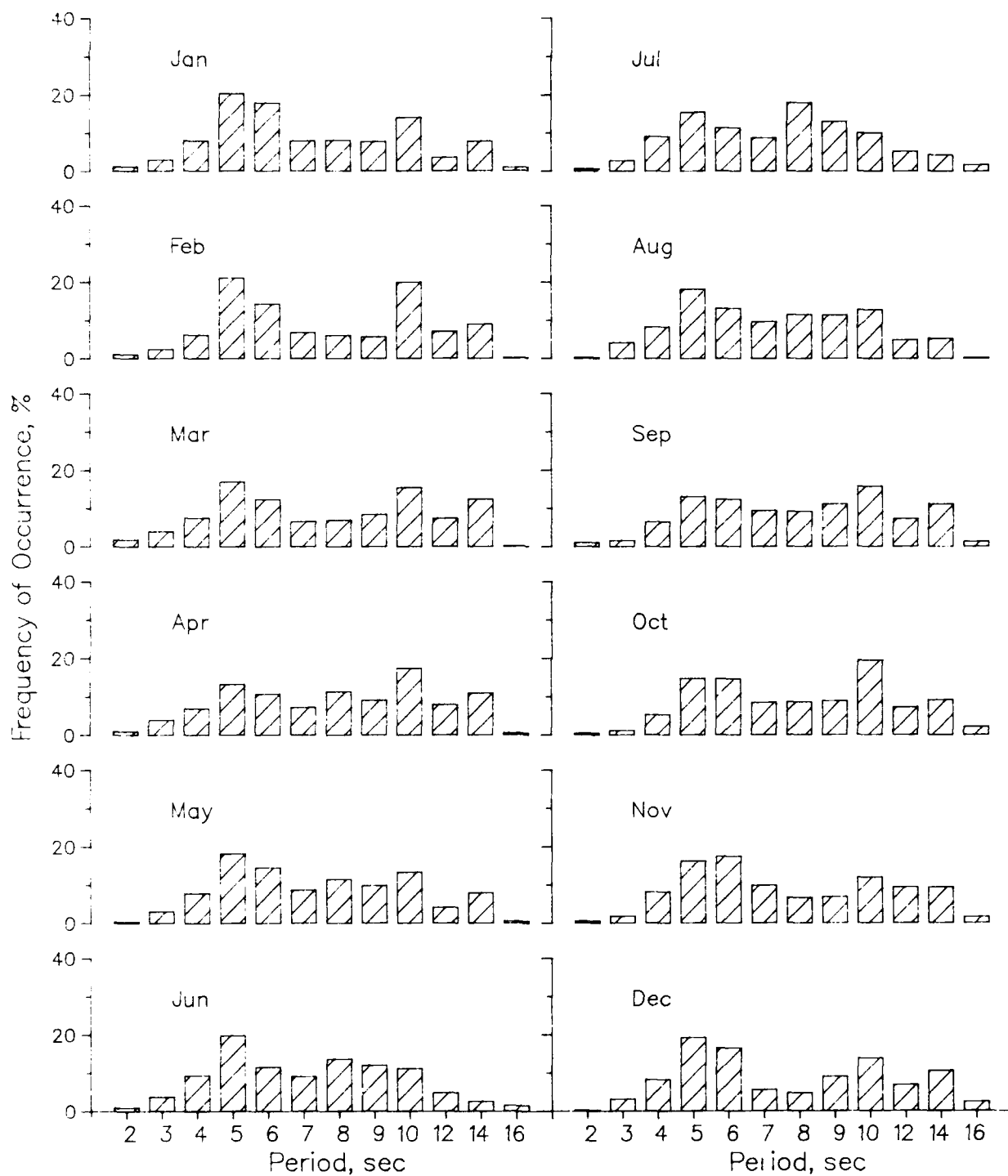


Figure E7. 1980-1987 monthly wave period distributions for Gage 645

Table E5
1987 Persistence of H_{mo} for Gage 645

Height (m)	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	47	43	31	24	18	12	10	9	8			6				4	3		2
1.0	51	28	18	11	8	4		2											
1.5	22	11	3	2		1													
2.0	3		1																

Table E6
1980 through 1987 Persistence of H_{mo} for Gage 645

Height (m)	Consecutive Day(s) or Longer																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19+
0.5	41	35	29	24	19	15	13	11	10	8		7	6		5			4	3
1.0	43	25	15	9	5	3	2	1											
1.5	13	6	2		1														
2.0	2																		

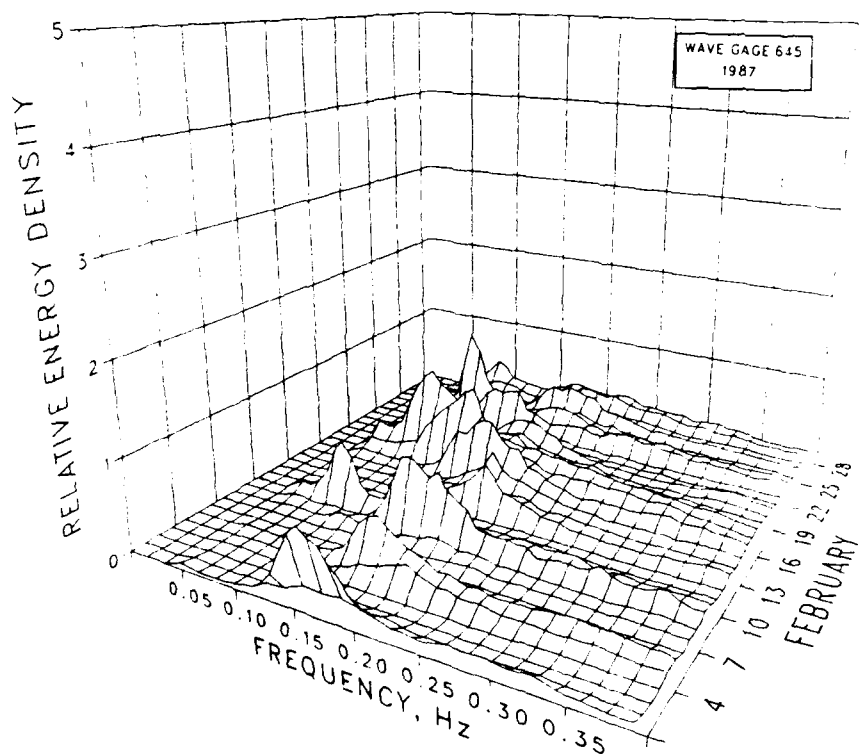
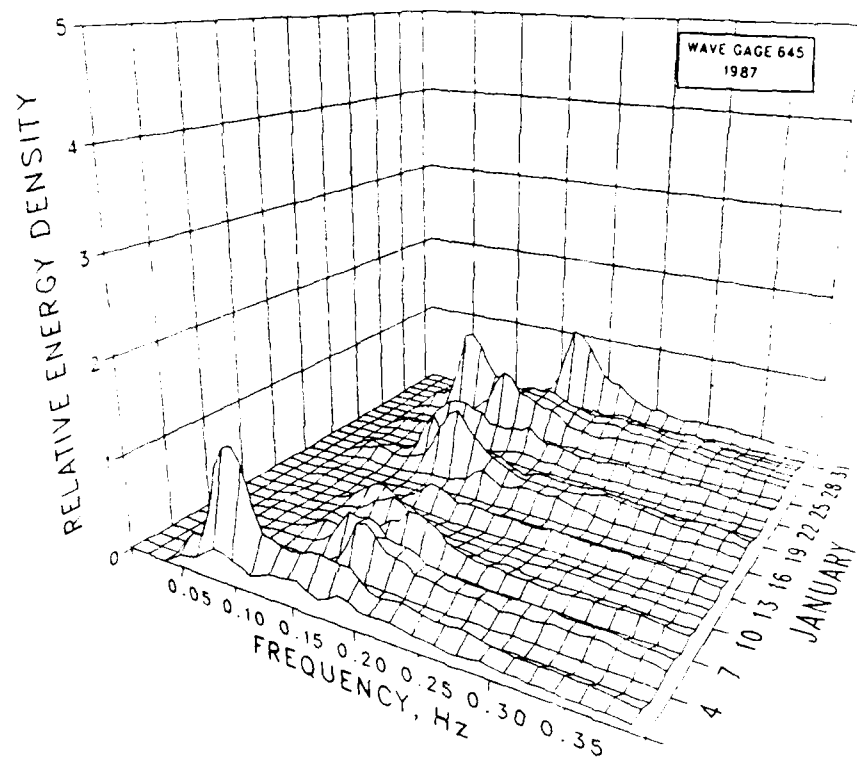


Figure E8. 1987 monthly spectra for Gage 645
(Sheet 1 of 6)

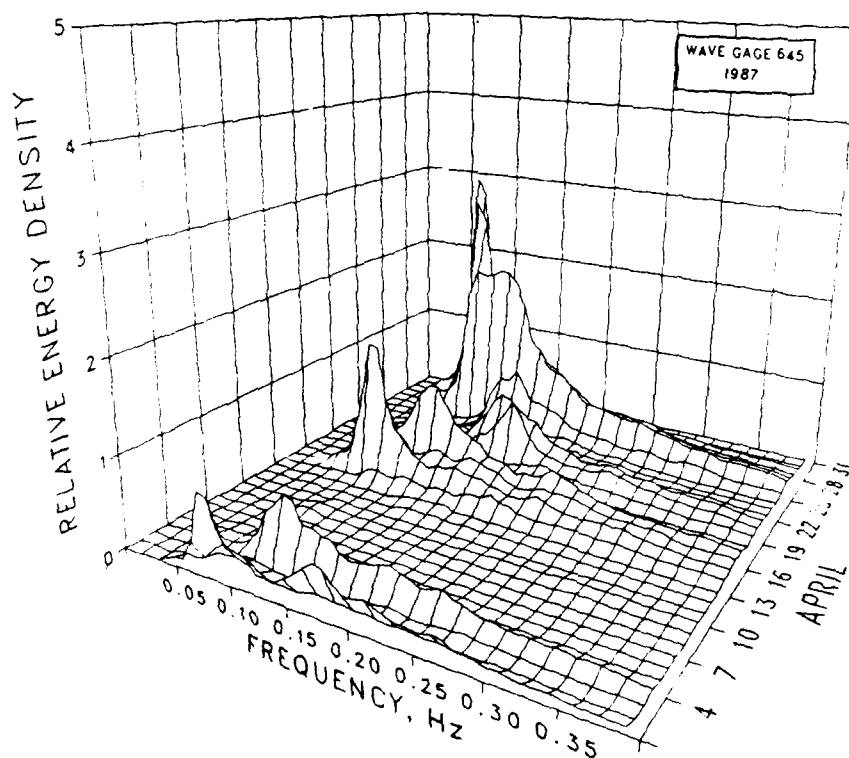
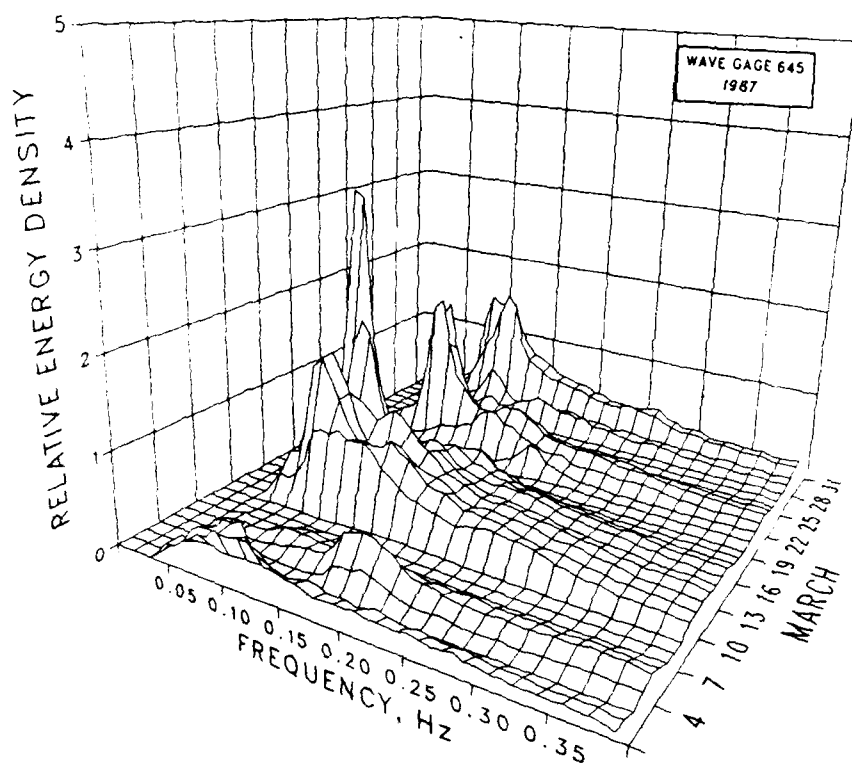


Figure E8. (Sheet 2 of 6)

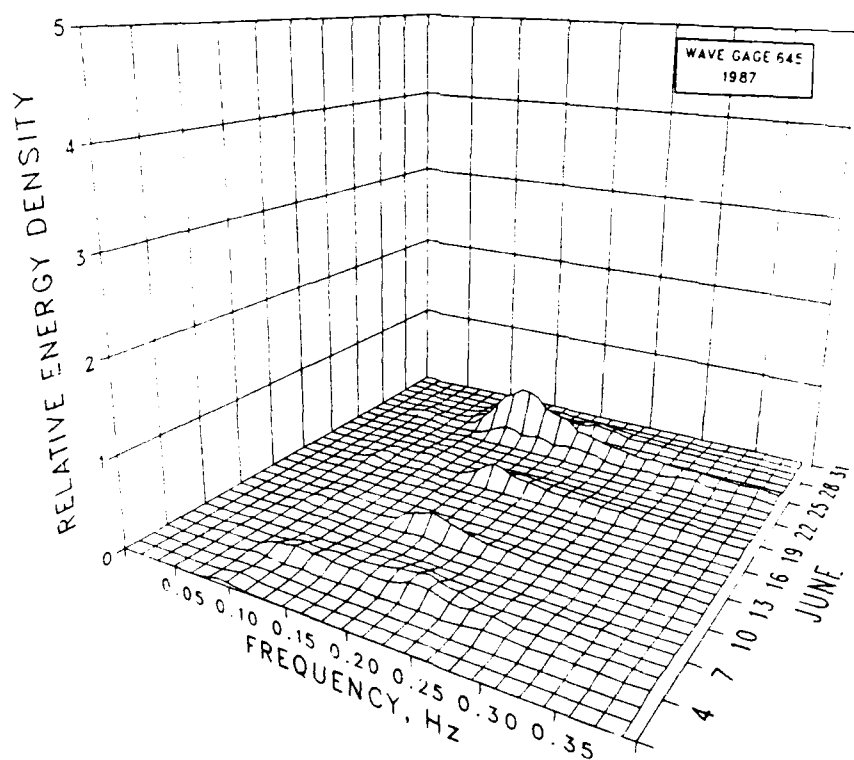
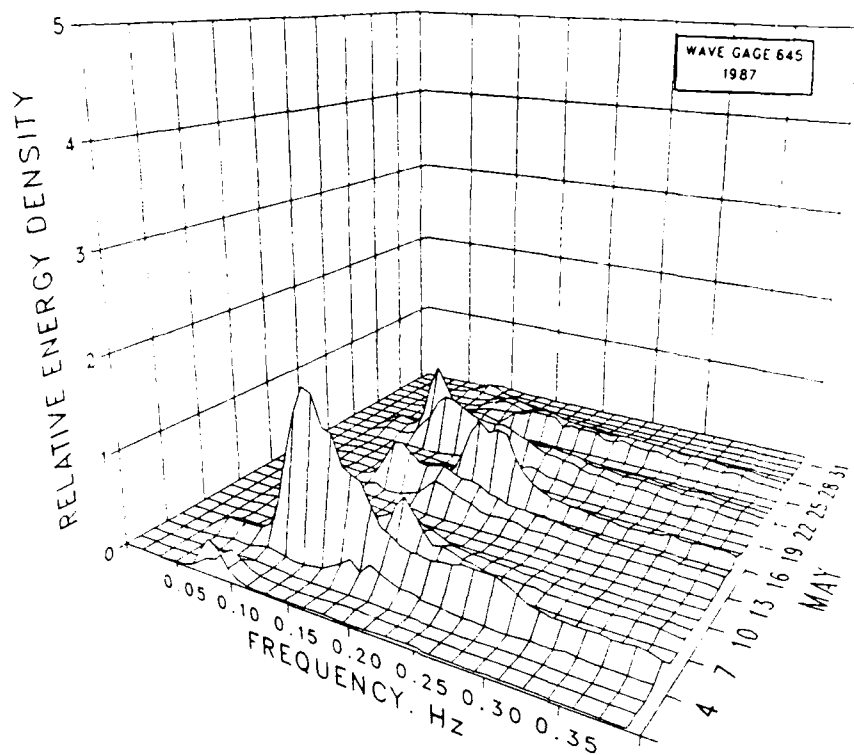


Figure E8. (Sheet 3 of 6)

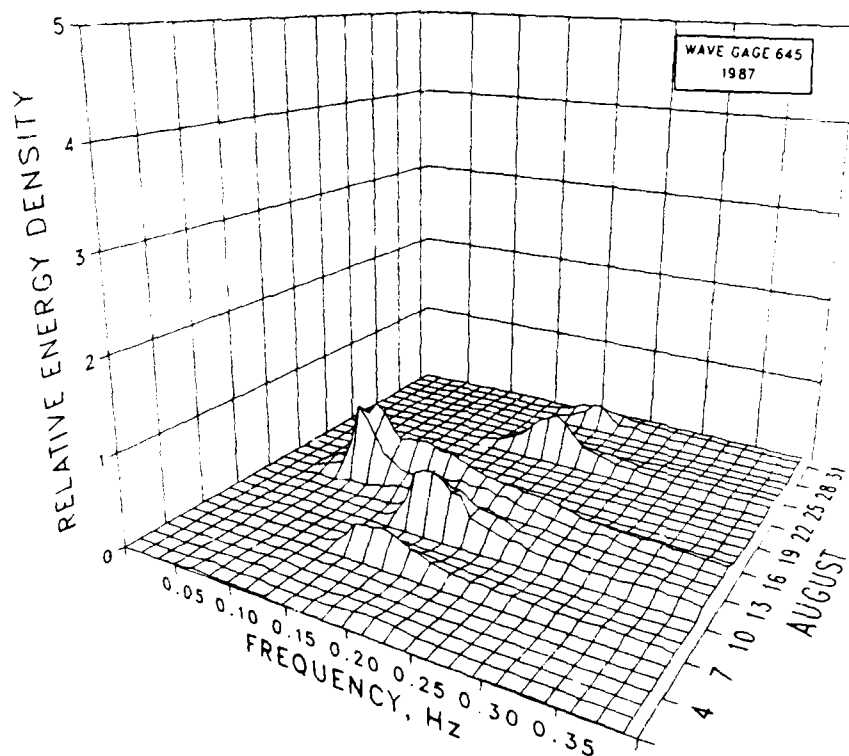
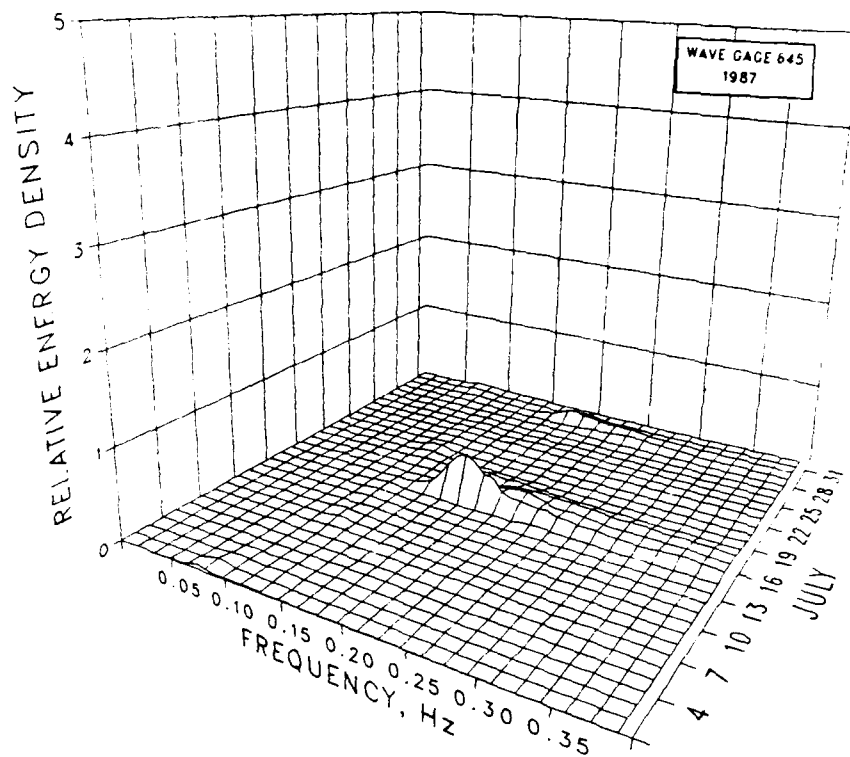


Figure E8. (Sheet 4 of 6)

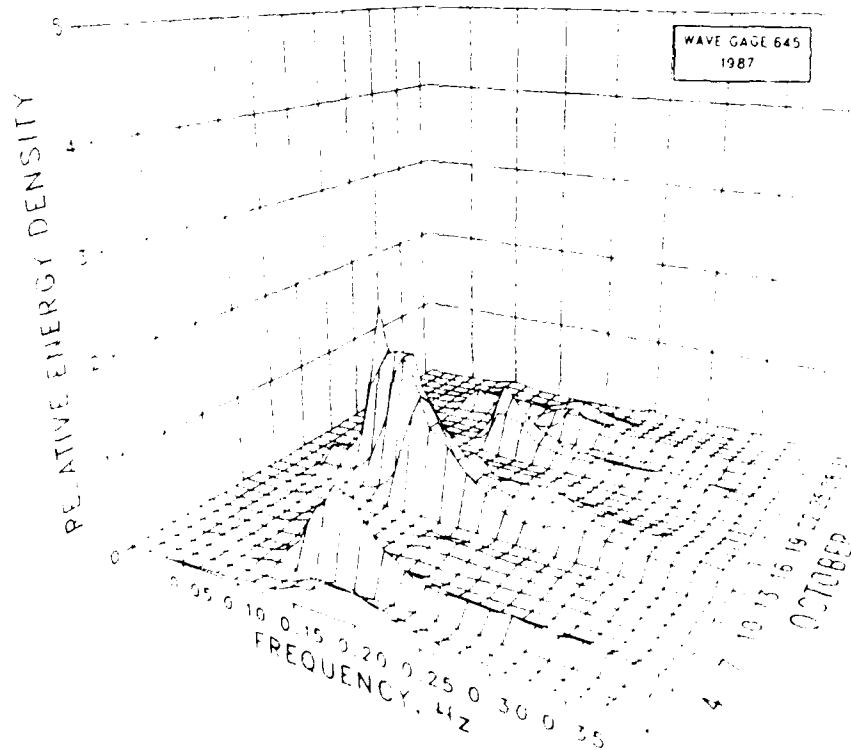
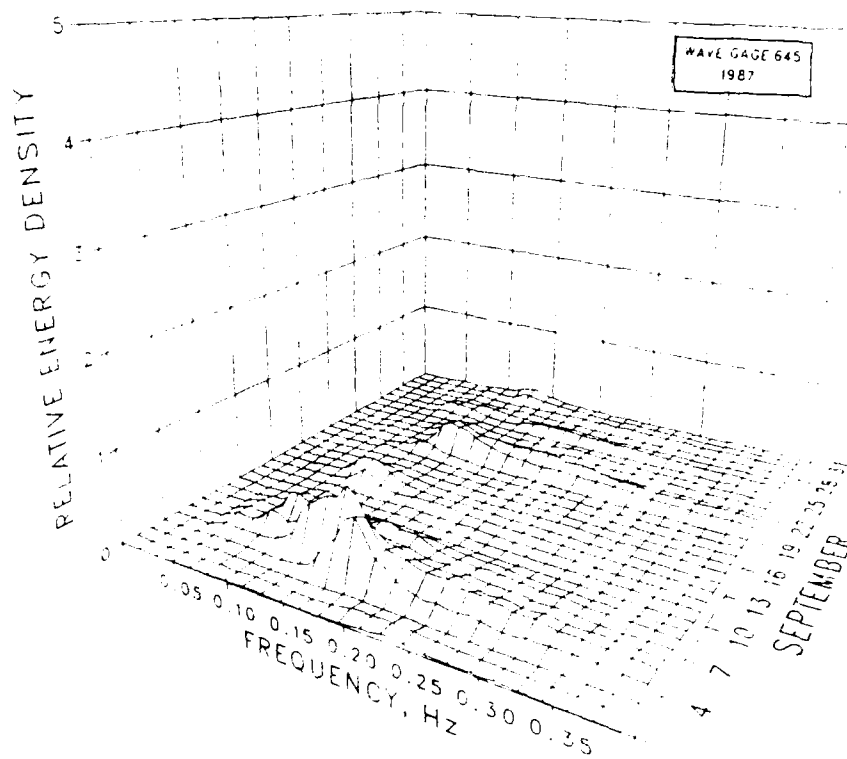


Figure E8. (Sheet 5 of 6)

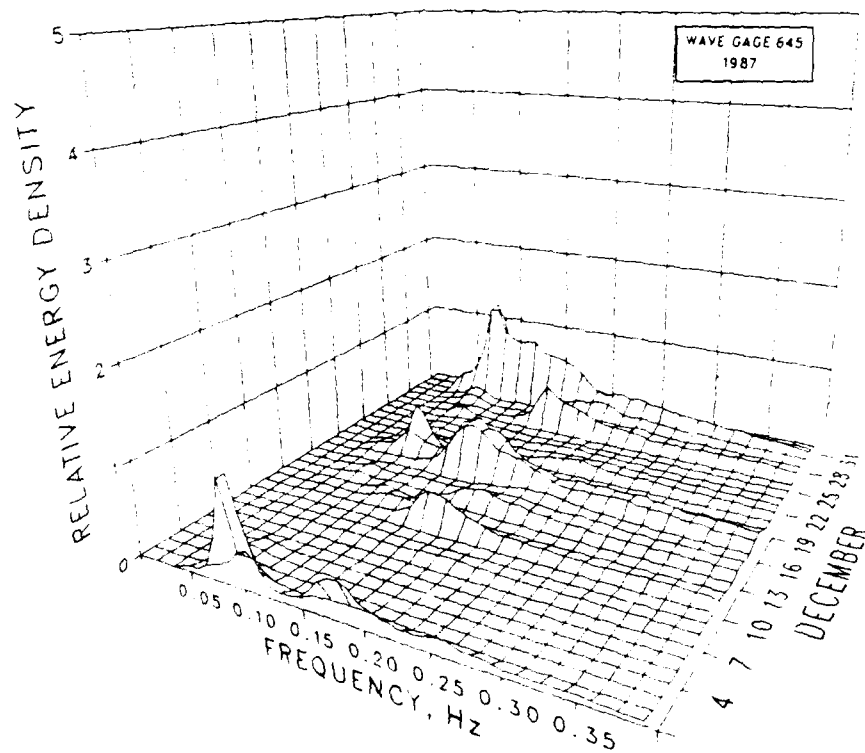
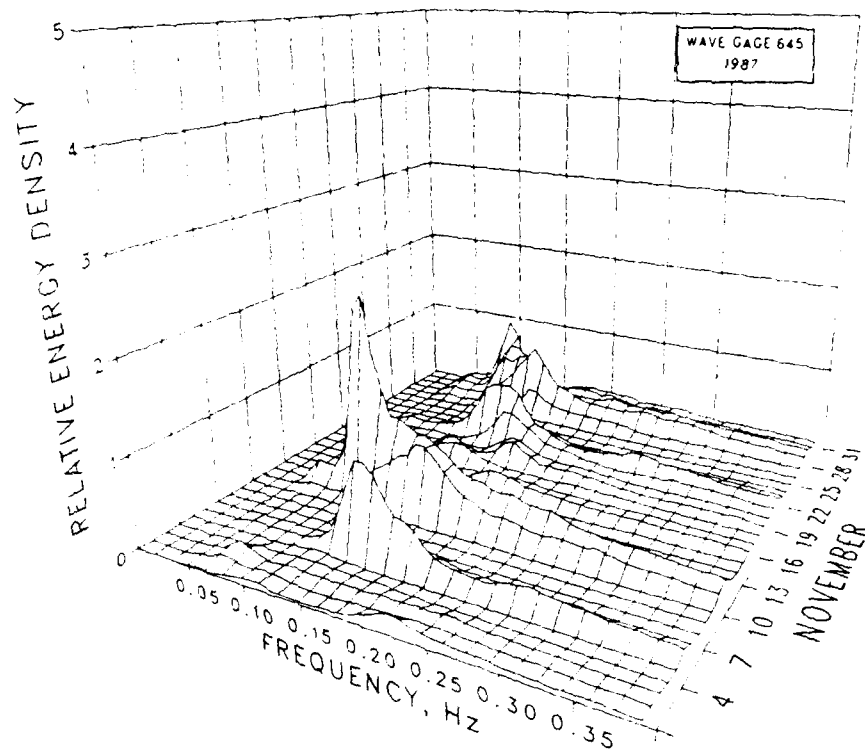


Figure E8. (Sheet 6 of 6)

Table E7
Wave Statistics for Gage 645

Month	1987							1980-1987						
	Height			Date	Period			Height			Date	Period		
	Std.				Std.			Std.				Std.		
	Mean	Dev.	Extreme		Mean	Dev.	Number	Mean	Dev.	Extreme		Mean	Dev.	Number
	m	m	m		sec	sec	Obs.	m	m	m		sec	sec	Obs.
Jan	0.9	0.5	1.8	1	7.8	3.0	120	0.8	0.4	2.0	1990	7.7	3.1	793
Feb	0.9	0.4	1.6	17	7.1	2.9	109	0.8	0.4	2.0	1983	8.2	3.2	787
Mar	1.1	0.6	2.0	15	9.1	3.1	122	0.8	0.4	2.3	1980	8.3	3.5	879
Apr	1.0	0.6	2.3	25	8.9	3.1	118	0.7	0.4	2.3	1987	8.6	3.3	794
May	0.7	0.5	2.0	5	8.9	2.5	103	0.6	0.3	2.0	1987	7.9	3.1	854
Jun	0.5	0.3	1.6	24	8.0	3.1	114	0.5	0.3	1.6	1987	7.6	3.0	824
Jul	0.4	0.2	1.1	15	7.9	2.9	121	0.5	0.2	1.3	1985	7.9	3.0	838
Aug	0.6	0.4	1.5	15	8.3	3.2	124	0.6	0.3	1.7	1982	7.8	2.9	866
Sep	0.6	0.3	1.4	5	8.8	3.0	120	0.7	0.4	2.1	1985	8.6	3.2	825
Oct	0.7	0.5	1.9	14	8.3	2.8	121	0.8	0.5	2.2	1982	8.7	3.2	887
Nov	0.7	0.5	1.9	12	8.2	2.8	117	0.8	0.4	2.0	1981	8.4	3.5	871
Dec	0.7	0.4	1.8	30	8.5	3.3	124	0.7	0.4	2.1	1985	8.3	3.6	865
Annual	0.7	0.5	2.3	Apr	8.3	3.0	1413	0.7	0.4	2.3	Apr 1987	8.2	3.3	10083

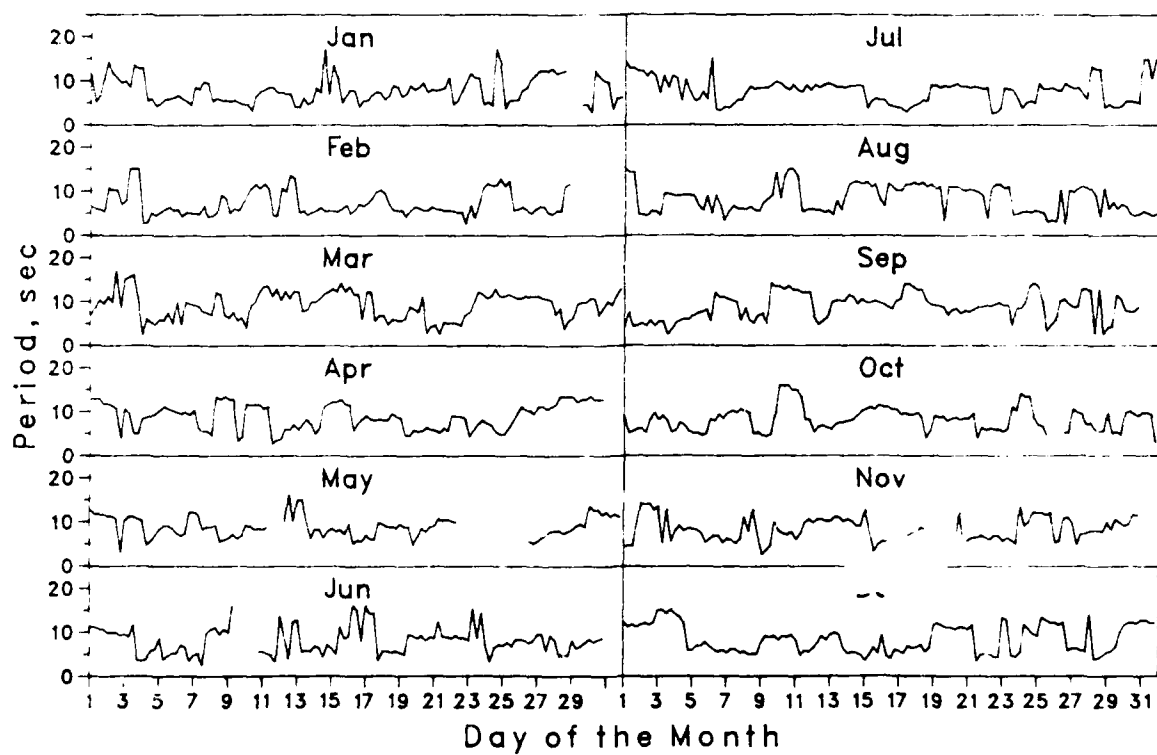
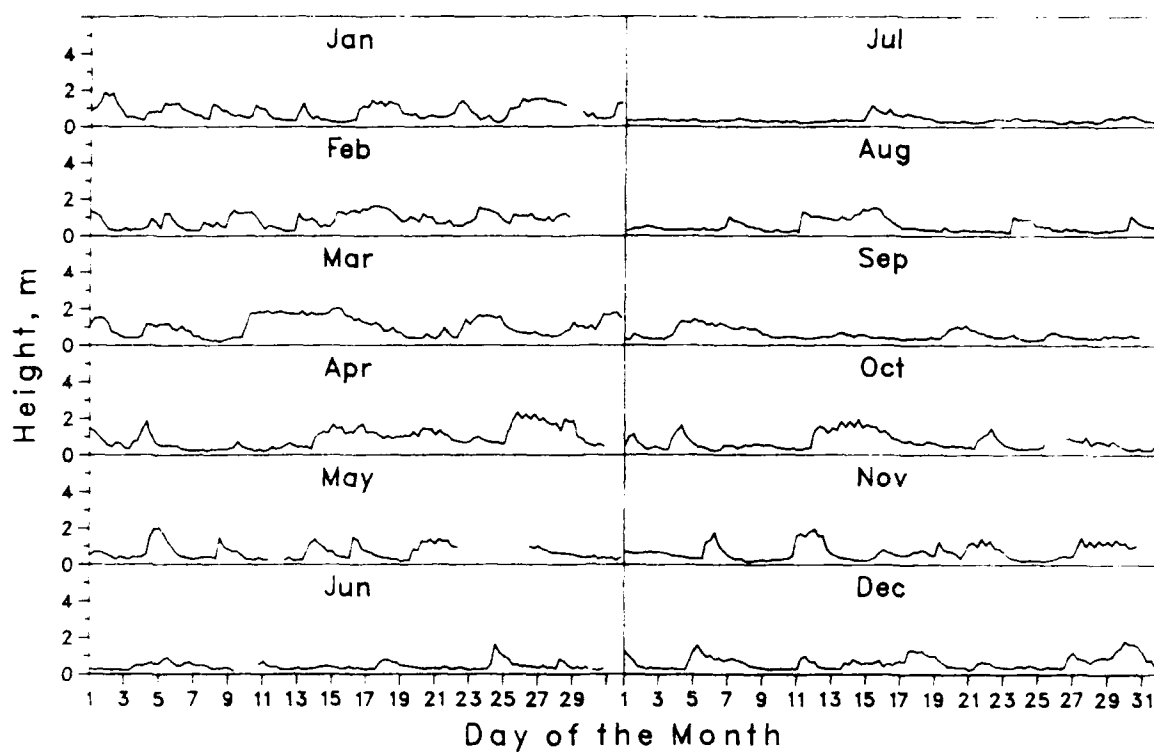


Figure E9. Time-histories of wave height and period for Gage 645